SONY

DIGITAL VIDEOCASSETTE RECORDER

DNW-A220/A220P

OPERATION MANUAL

1st Edition (Revised 4) English

BETACAM SX

Serial No.50001 and Higher
(Player)
Serial No. 30001 and Higher
(Recorder)

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

For the customers in the USA

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of th e FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

— Reorient or relocate the receiving antenna.
— Increase the separation between the equipment and receiver.
— Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
— Consult the dealer or an experienced radio/TV technician for help.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

For the customers in Europe

This product with the CE marking complies with the EMC Directive (89/336/EEC) issued by the Commission of the European Community. Compliance with this directive implies conformity to the following European standards:

- EN55103-1: Electromagnetic Interference (Emission)
- EN55103-2: Electromagnetic Susceptibility (Immunity)

This product is intended for use in the following Electromagnetic Environment(s):
E1 (residential), E2 (commercial and light industrial), E3 (urban outdoors) and E4 (controlled EMC environment, ex. TV studio).

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1-1 Features

The DNW-A220/A220P is a digital portable editor for the Betacam SX format. It is comprised of two VTRs, each equipped with a color LCD monitor and speaker to enable editing of news material in the field.

The features of this unit include the following.

Betacam SX format

This unit supports the Betacam SX format, developed by Sony as the digital version of the Betacam SP format. No format conversion is needed for use with nonlinear editing systems and server systems.

Playback compatibility with Betacam SP

This unit uses S-cassettes.
The left-side VTR (the player) can play tapes recorded in the Betacam and Betacam SP formats, allowing you to make effective use of Betacam and Betacam SP cassettes recorded in the past. You can assemble news gathering systems that combine this unit with conventional Betacam SP camcorders.

Digital signal processing

This unit processes 4:2:2 component digital signals in the D-1 format.

Inter-frame data compression

Inter-frame data compression by MPEG2 4:2:2 Profile @ Main Level (1 GOP = 2 frames) reduces the volume of data to about $^{1}/_{10}$.

Rich variety of input and output signals

The following input and output signals are supported.
- SDI (serial digital interface) video and audio
- Analog composite video
- Analog audio
- Timecode

Powerful editing functions

This unit can perform assemble editing, insert editing, and audio split editing. DMC (dynamic motion control) is possible when both the source and recording sides use the Betacam SX format.
This unit can also be connected to a BVE series or other editor for remote editing.

Sequential recording

This unit allows you to perform sequential recording with the recorder and player.
When you perform overwrite recording using only two cassettes, the last two hours recording can be obtained at any time. When you renew the cassette about every 1 hour, endless recording is possible.

Good Shot marks/Shot data

During tape rewinds, this unit reads the REC Start (RS) and Good Shot (GS) marks recorded by Betacam SX camcorders, and builds an index. The index facilitates quick cue-ups of desired marks (index search function), for greater editing efficiency.
When shot data is recorded on the tape, you can display the data and make use of it for sorting shot marks.

Preread editing

You can execute preread editing, using video or audio signals recorded on the tape as the edit source for insert editing. Using this function, the previously read signals can be sent to mixers for mixing and returned to the original channels.

AC and DC power

This unit is equipped with V-shoe attachment, on which BP-L60(A)/L90(A) or BP-90(A) battery or an AC adaptor can be mounted. The unit can operate for about 90 minutes with two BP-L90 batteries mounted. For AC operation, you can connect two AC-550/550CE adaptors or one AC-DN2(A) adaptor.

525 or 625 versatility

When using the Betacam SX format, 525 or 625 mode recording and playback can be selected from a menu. When using the Betacam and Betacam SP formats, only simple viewing is possible for tapes recorded in different mode.

Detachable VTRs

The two VTRs of the unit can be detached for independent operation.

Economical

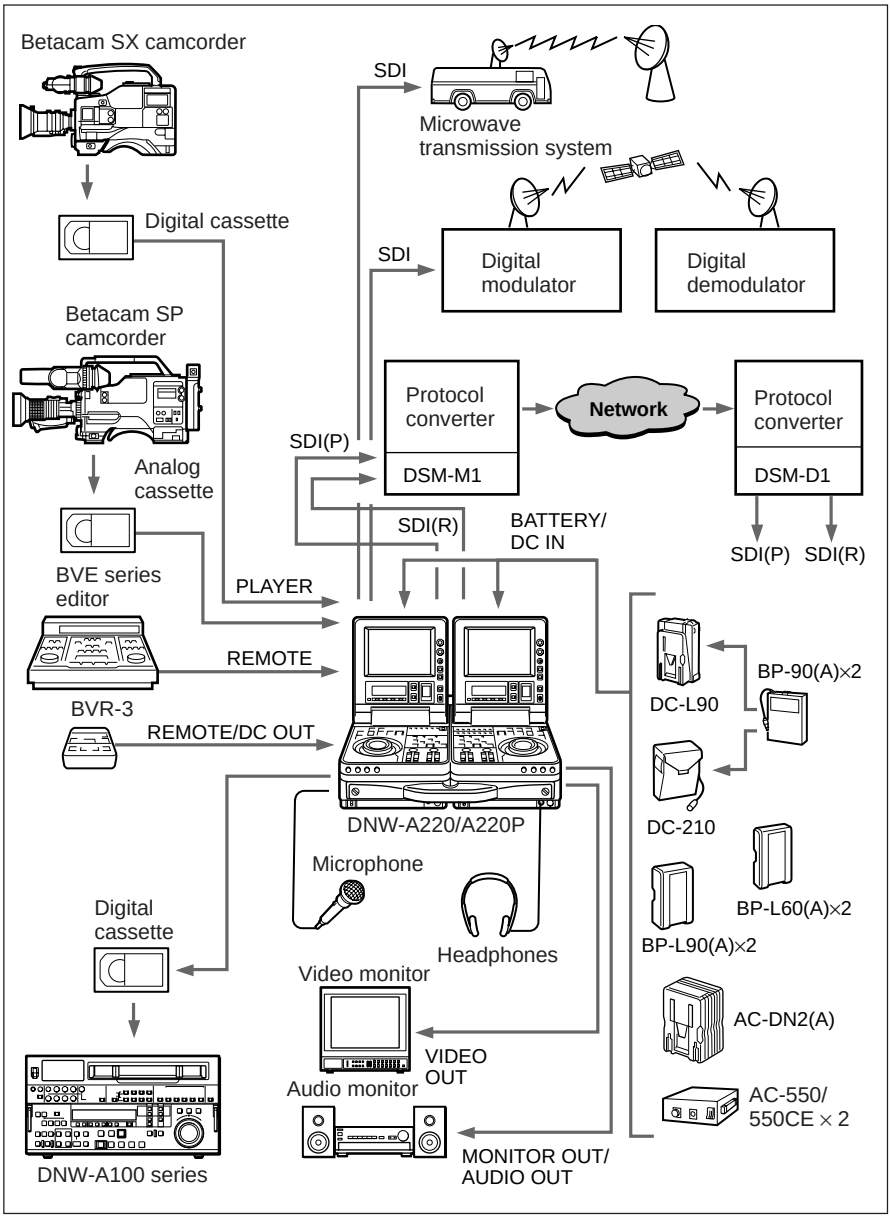
- Betacam SP cassettes and inexpensive UVW cassettes can be used in addition to Betacam SX cassettes.
- Special high-durability heads and components contribute to reduced maintenance costs.

Compact and lightweight

Even though it is a standalone editor with two VCRs, each equipped with an LCD monitor and a speaker, thanks to its compact design and light weight, you can carry it easily.

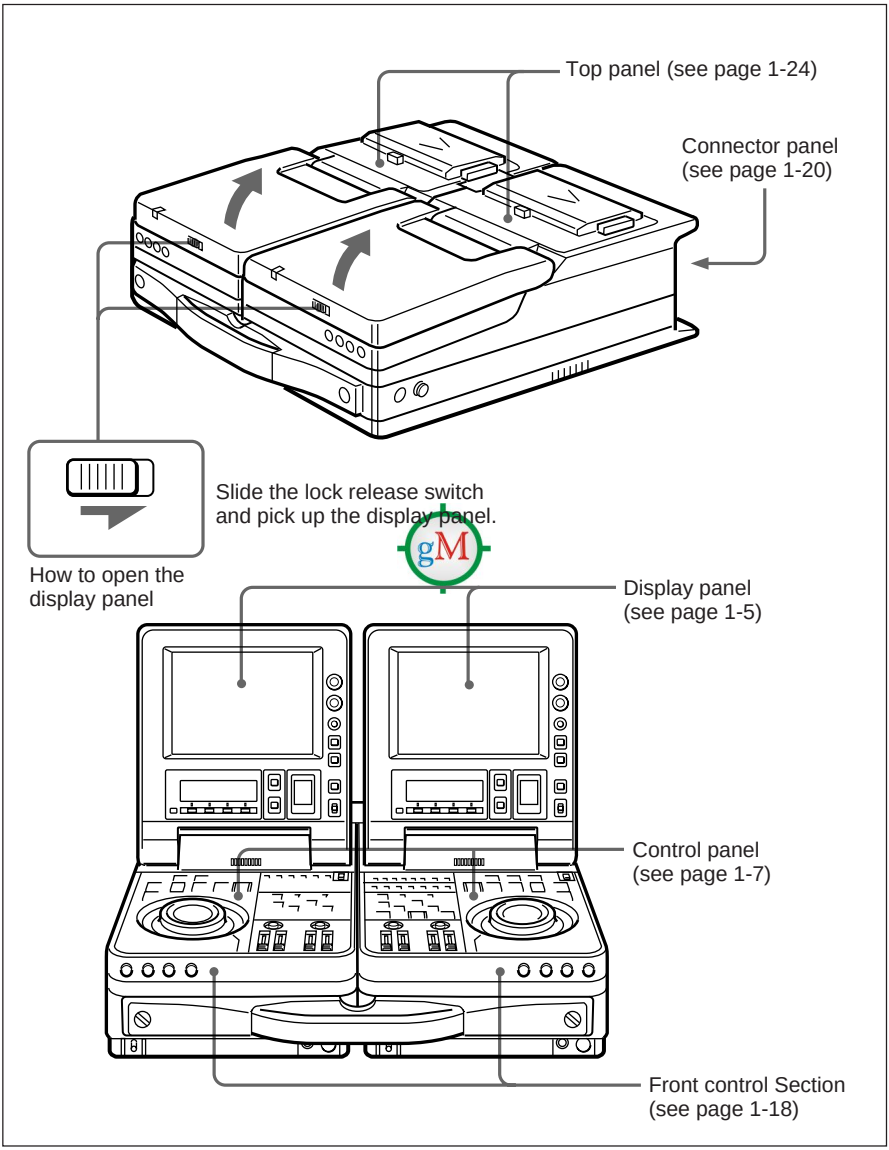
1-2 System Configuration

The figure below shows an example of an editing system configured around the DNW-A220/A220P.

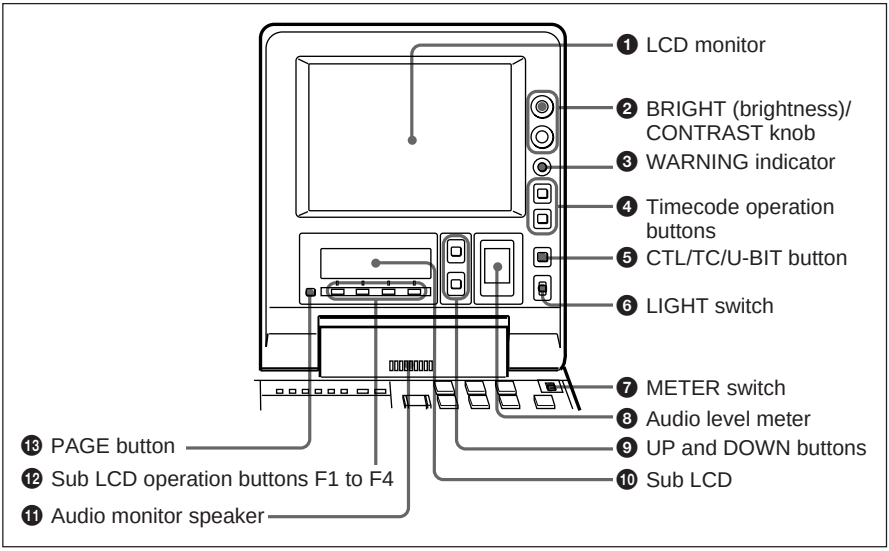


1-3 Locations and Functions of Parts

This unit is comprised of the parts shown in the figure below.



1-3-1 Display Panel



❶ LCD monitor
Displays the playback of the player and recorder or E-E pictures. Time data, status information, and setup menus, etc are superimposed on the LCD monitor.

❷ BRIGHT (brightness)/ CONTRAST knob
Adjusts the brightness and contrast of the LCD monitor ❶. Adjustments have no effect on the recorded or output video.

❸ WARNING indicator
Lights when the battery is exhausted or an error occurs.
It flashes in the following cases.
- When the end of battery power is near
- When the number of memorized shot marks reaches to 200 during shot mark reading or when you start reading shot marks after 200 marks have been read.
- When the tape's recording mode does not agree with the playback mode set on the unit (recorder side: SX, player side: SP TAPE switch position) during playback of a Betacam SP tape (if setup menu item 127 is set to ON *(page 6-13)*).

❹ Timecode operation buttons
HOLD button: Stops the progress of the timecode generator. Press this button before setting timecode or user bits to hold those values.
RESET button: Resets the CTL, TC, and U-BIT values displayed in the sub LCD ❿ to 0. Resetting the CTL value erase all edit points that have been set.

For more information, see section 2-5 "Setting Timecode".

❺ CTL/TC/U-BIT button
Alternately selects CTL (control), TC (timecode), and U-BIT (user bits) as the time data used in editing and displayed in the sub LCD ❿.

❻ LIGHT (backlight on/off) switch
Turns the backlights of the sub LCD ❿ and audio level meter ❽ on and off.

You can also use the LIGHTSW setting of the sub LCD menu to turn the LCD monitor power on and off. For details, see page 2-31.

❼ METER switch
Selects the audio channel whose level is displayed by the audio level meter ❽.

CH-1/2: Display the recording, playback, and E-E levels of audio channels 1 and 2.

CH-3/4: Display the recording, playback, and E-E levels of audio channels 3 and 4.

❽ Audio level meter
Displays the recording and playback audio levels of two (CH-1/2 or CH-3/4) of the four audio channels (CH-1 to CH-4), as selected with the METER switch ❼.

❾ UP and DOWN buttons
Press to make settings in the sub LCD menu.

Settings made by sub LCD menu include video and audio input and output settings, and reference video signal settings. For details, see section 2-6-1 "Displays on the Home Page of the Sub LCD Menu".

❿ Sub LCD
Displays time data, status information, sub LCD menu, setup menu and error messages.

For more information about the sub LCD menu, see section 2-6-1 "Displays on the Home Page of the Sub LCD Menu".

⓫ Audio monitor speaker
Plays the mixed audio signal of L and R selected with the MONITOR L/R in the sub LCD menu. Ajust the volume with the LEVEL knob on the front control panel. You cannot monitor sound from the speaker when headphones are connected to the HEADPHONES jack.

For more information about the MONITOR L/R, see page 2-25.

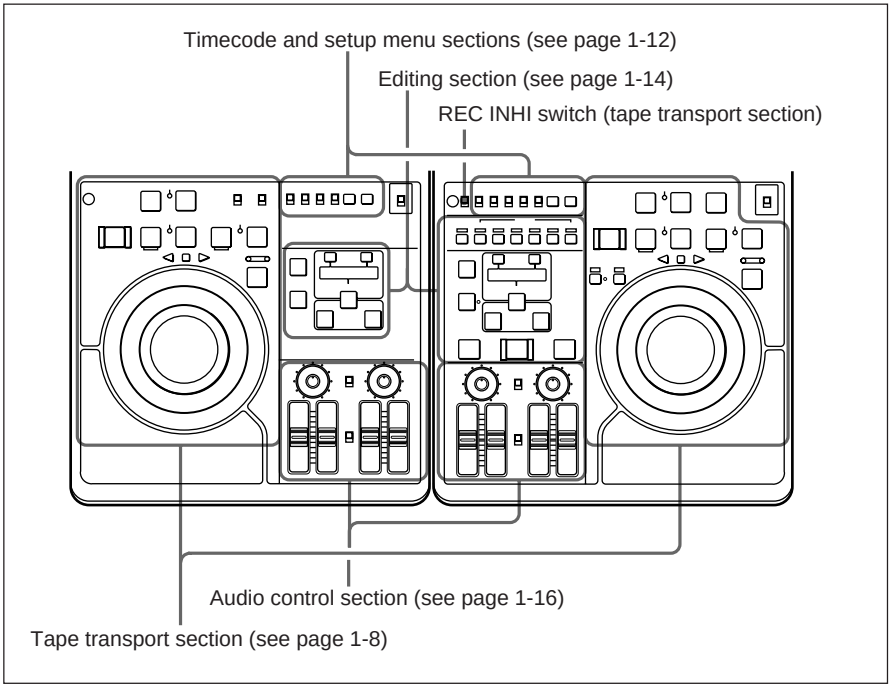
⓬ Sub LCD operation buttons F1 to F4
Select items in the sub LCD menu.

For more information about the sub LCD menu, see section 2-6-1 "Displays on the Home Page of the Sub LCD Menu".

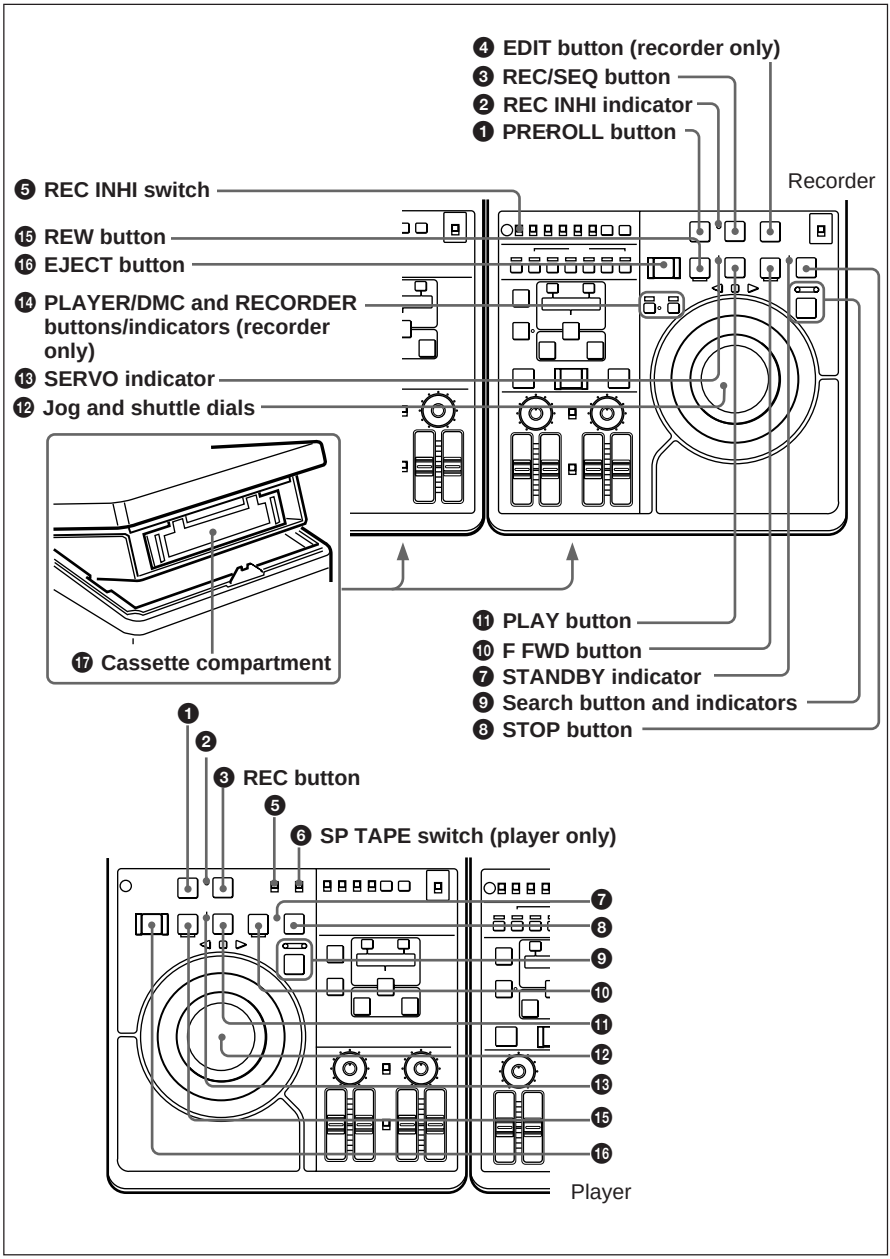
⓭ PAGE button
Switches between pages in the sub LCD menu.

For more information about the sub LCD menu, see section 2-6-1 "Displays on the Home Page of the Sub LCD Menu".

1-3-2 Control Panel



Tape transport section



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❶ PREROLL button
Press to run the tape up to the preroll point (located in advance of the IN point by the amount of the preroll time). You can set the preroll time using setup menu item 001. You can set the state of the unit at the end of preroll by using setup menu item 401. By pressing this button at the same time as the IN/OUT or AUDIO IN buttons in the editing sections, you can search for a timecode set in advance and stop at that position. (The tape is cued up to the preset timecode position.)

❷ REC INHI (recording inhibit) indicator
Lights under the following situations.
- Set the REC INHI switch ❺ to ON.
- Press in the erasure prevention plug.
- Insert the Betacam SP cassette in the player and set the SP TAPE switch ❻ to SP PB ONLY.
- Insert the Betacam cassette (oxide tape).

When the REC INHI switch ❺ is set to OFF, it is possible to set this indicator flashing instead of lighting under the latter three situations. For details, see setup menu item 107 on page 6-12.

❸ REC/SEQ (recording/sequence) button (recorder)
REC (recording) button (player)
Press together with the PLAY button ⓫ to start recording.
The recorder side REC/SEQ button can be used for sequential recording by the recorder and player.

For details, see 4-2 "Sequential Recording".

To monitor E-E mode
You can monitor input signals in E-E mode by pressing this button from stop mode. The button lights when pressed. To return to the original picture, press the STOP button ❽. You can view E-E video during playback, search, fast forward, and rewind by pressing this button. The E-E video continues for as long as the button is kept pressed.

❹ EDIT button (recorder only)
Press together with the PLAY button ⓫ to perform manual editing.

To monitor E-E mode
You can monitor input signals in E-E mode by pressing this button from stop mode. The button lights when pressed, and the input signals selected with the ASSEMBLE or INSERT buttons appear in E-E mode. To return to the original picture, press the STOP button ❽. You can view E-E video during playback, search, fast forward, and rewind by pressing this button. The E-E video continues for as long as the button is kept pressed.

❺ REC INHI switch
When on, recording to the tape is inhibited, regardless of the state of the cassette's erasure prevention plug. (The REC INHI indicator ❷ lights.)

❻ SP TAPE switch (player only)
Selects the recording/playback format when a Betacam SP cassette (including UVW cassette) is loaded in the player.

SX: Record or play back in Betacam SX format.

SP PB ONLY: Play back in Betacam SP format. (Recording to a Betacam SP cassette is impossible.)

Note

This switch does not function for Betacam (oxide) and Betacam SX cassettes. These cassettes are distinguished automatically from the Cassette ID hole when the cassette is loaded.

❼ STANDBY indicator
Lights when the tape drum is rotating with tension applied (standby on). It goes out when the drum stops rotating and tension is released (standby off). To protect the tape, the unit normally changes to standby off when stop mode continues for longer than eight minutes. If you operate a dial or any of the tape transport buttons except STOP while the unit is in this state, the unit changes to standby on and enters the mode of the button or dial that you pressed.
Press the ENTRY and STOP buttons at the same time to switch between standby on and standby off manually.

For more information about tape protection, see the setup menu items in the 500s on page 6-20.

❽ STOP button
Press this button, lighting it, to stop playback or recording. When you stop playback, the LCD monitor displays E-E or still picture playback, depending on the settings of the monitor output switches in the timecode and setup menu section.

When setup menu item 105 is set to ON (page 6-11), this button flashes if the reference video signal specified in the OUT REF item of the sub LCD menu (page 2-30) and item 309 in the setup menu (page 6-16) is not being input.

For more information about reference video signal settings, see page 2-11.

❾ Search button and indicators
Press to enter search mode. (The JOG or SHUTTLE indicator lights.)
When the unit is in jog or shuttle mode, keep this button depressed for about 1 second to enter variable mode. (The both indicators light.) To return to shuttle mode, keep this button depressed again for about 1 second.
In shuttle or variable mode, you can start playback at preset speed by rotating the shuttle dial to the desired position and pressing this button.

❿ F FWD (fast forward) button
Press this button, lighting it, to fast forward the tape.
When using a tape on which shot marks have been recorded, you can press this button together with the TRIM –/LIST button to read shot marks from the tape, and press this button together with the TRIM +/ MARK button to cue up shot mark positions.

For details, see Chapter 5 "Shot Mark/Shot Data".

⓫ PLAY button

Press this button, lighting it, to start playback. Recording starts when you press this button together with the REC/(SEQ) button, and manual editing starts when you press this button together with the EDIT button. If you press this button only during recording or manual editing, recording or manual editing stops and the unit returns to playback mode.
This button is also used to display the shot data if it is recorded on the tape.

For details, see 5-1-3 "Reading Shot Data".

⓬ Jog and shuttle dials

To search in shuttle or variable mode, rotate the outer ring (shuttle dial). To search in jog mode, press the inner ring (jog dial) until it clicks and then rotate. Rotate in the clockwise direction to search in the forward direction (the FORWARD indicator lights), and rotate in the counterclockwise direction to search in the reverse direction (the REVERSE indicator lights).

For more information about search, see page 3-3.

⓭ SERVO indicator

Lights when the drum servo and capstan servo are locked.

⓮ PLAYER/DMC and RECORDER buttons/indicators (recorder only)

Press to control a player connected to the REMOTE (9-pin) connector by remote control (the indicator lights).

PLAYER/DMC button: The buttons of the editing and tape transport sections on the recorder side of the control panel work to control the remote player.
You can also press this button together with the ENTRY/SHIFT button to put the unit into DMC edit mode.

For details, see 3-5 "DMC Editing".

RECORDER button: The buttons of the editing and tape transport sections on the recorder side of the control panel work to control the recorder itself.

⓯ REW (rewind) button

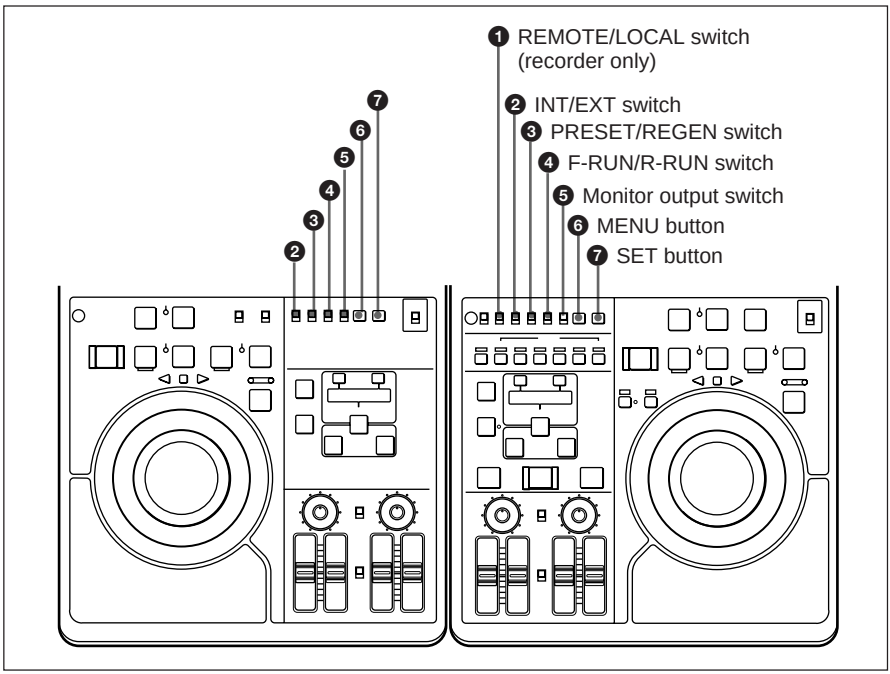
Press this button, lighting it, to rewind the tapes.
When using a tape on which shot marks have been recorded, you can press this button together with the TRIM –/LIST button to read shot marks from the tape, and press this button together with the TRIM +/ MARK button to cue up shot mark positions.

For details, see Chapter 5 "Shot Mark/Shot Data".

⓰ EJECT button
Press to eject the cassette or open the cassette compartment ⓱. The buttons light while cassettes are being ejected. If you insert a cassette which cannot be used on this unit, the button flashes. Press the button to eject the cassette.

⓱ Cassette compartment
Insert a cassette here. Press the EJECT button ⓰ to open the compartment.

Timecode and setup menu sections



❶ REMOTE/LOCAL switch (recorder only)
Selects the source for control of this unit. The player is always set as controlled from the equipment connected to the REMOTE connector.

REMOTE: This unit is controlled from the device connected to the REMOTE connector. In this case, all VTR operations using this unit's control panel are disabled except the STOP and EJECT buttons.

LOCAL: This unit is controlled from the control panel. Normally set the switch to this position.

When the REMOTE is selected, you can determine which tape transport control buttons on the control panel are enabled. See setup menu item 006 on page 6-3.

❷ INT/EXT (internal/external timecode) switch

Selects the timecode to use.

INT: Use the timecode generated by this unit's built-in timecode generator.

EXT: Use external timecode. When the VITC/LTC/AUTO item of the sub LCD menu is set to LTC or AUTO, the external timecode input to the TC IN connector. When it is set to VITC, the VITC of input video signal.

For more information about the VITC/LTC/AUTO settings, see page 2-21.

❸ PRESET/REGEN (regenerate) switch

Selects the value set in the internal timecode generator.

PRESET: Preset the initial value of the timecode generated by the internal timecode generator, either by a control panel operation or by remote control from the device connected to the REMOTE connector.

REGEN: Synchronize the internal timecode generator with the timecode read by the internal timecode reader.

❹ F-RUN/R-RUN (free-run, rec-run) switch

Selects the progression method for the timecode generated by the internal timecode generator.

F-RUN: Timecode progresses continuously from the time when this unit is powered on, regardless of the unit's operating status.

R-RUN: Timecode progresses only during recording.

When you use this switch, set the INT/EXT switch ❷ to INT, and set the PRESET/REGEN switch ❸ to PRESET.

❺ Monitor output switch

Selects the output signals from the VIDEO and AUDIO OUTPUT connectors during fast forward, rewind, stop, and standby mode.

PB: Playback (PB) mode

PB/EE: E-E mode

❻ MENU button

Use for setup menu operations. The setup menu appears on the LCD monitor when you press this button, and the original display appears when you press it again.

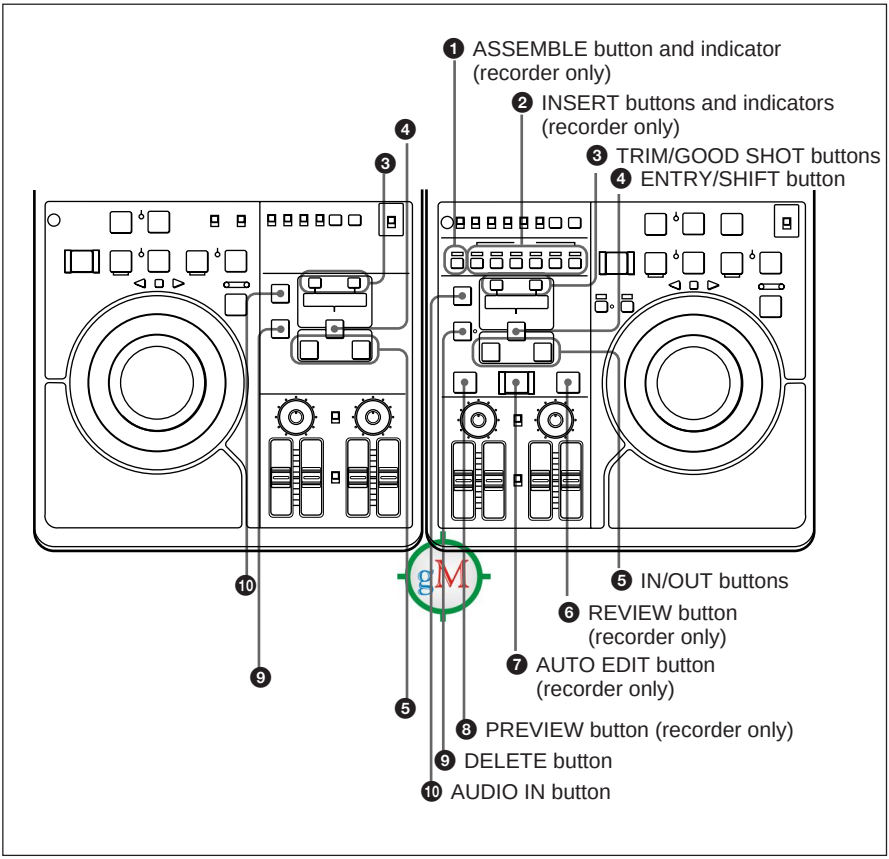
For more information about setup menu operations, see Chapter 6, "Setup Menu".

❼ SET button

Use to make setup menu settings, timecode settings, and user bit settings.

For more information about setup menu operations, see Chapter 6, "Setup Menu". For more information about timecode and user bit settings, see 2-5 "Setting Timecode".

Editing section



❶ ASSEMBLE button and indicator (recorder only)
Press this button, lighting the indicator, to carry out assemble editing. Press the button again, turning the indicator off, to leave assemble edit mode.

❷ INSERT buttons and indicators (recorder only)
Press these buttons, turning the indicators on, to select signals for insert editing. Press the buttons again, turning the indicators off, to cancel the selection.

VIDEO button: Selects the video signal.

AUDIO CH-1 to CH-4 buttons: Select the audio signals of channels 1 to 4 (multiple selections possible).

TC button: Selects the timecode signal.

❸ TRIM/GOOD SHOT buttons
Press the +/MARK or –/LIST buttons while pressing the IN/OUT buttons ❺ or AUDIO IN button ❿ to adjust edit points in unit of 1 frame. The +/MARK button advances 1 frame, and the –/LIST button returns 1 frame. When using a tape on which shot marks have been recorded, you can press the –/LIST button together with the FWD or REW button to read shot marks from the tape, and you can press the +/MARK button together with the FWD or REW button to cue up shot mark positions.

For details, see Chapter 5 "Shot Mark/Shot Data".

❹ ENTRY/SHIFT button
Press together with the IN button, the OUT button, or the AUDIO IN button to set edit points. The buttons for the edit points that you set light.
Pressing this button together with a button with two functions, such as the PLAYER/DMC button or the REC/SEQ button, selects the function indicated in orange on the button.
This button is also used to write shot marks on the tape.

For details, see 5-2-2 "Writing Shot Marks".

❺ IN/OUT (IN point/OUT point) buttons
Press these buttons, lighting them, together with the ENTRY/SHIFT button ❹ to set an IN point (edit start point) or OUT point (end point). After setting edit points, you can press these buttons to display the edit points in the sub LCD.

❻ REVIEW button (recorder only)
After executing an automatic edit, press this button, lighting it to review the results of the edit.

❼ AUTO EDIT button (recorder only)
After setting edit points, press this button, lighting it to execute an automatic edit (record to the recorder). If an IN point has not been set, the point where you press this button is used as the IN point in the automatic edit. This button lights during execution and goes out when execution finishes.
Pressing this button when the unit is in DMC edit mode executes a DMC edit.

To conduct DMC editing, a playback speed must be set in advance. For details, see 3-5"DMC Editing".

❽ PREVIEW button (recorder only)
Press this button, lighting it, when you want to preview editing results on the monitor after setting edit points but before executing an edit, or when you want to set the player speed for DMC editing. If an IN point has not been set, the point where you press this button is used as the IN point in the preview. This button lights during the preview and goes out when the preview finishes.

❾ DELETE button
Press together with the IN/OUT buttons ❺ or the AUDIO IN button ❿ to delete edit points. The buttons go out or flash.
The DELETE button flashes to indicate contradictions that will prevent previews and automatic editing, for example when the durations are different on the player and recorder, or when the IN and OUT points are equal or reversed. In this case, set the edit points again.
Also, press together with the PLAYER/DMC button to cancel DMC edit mode.

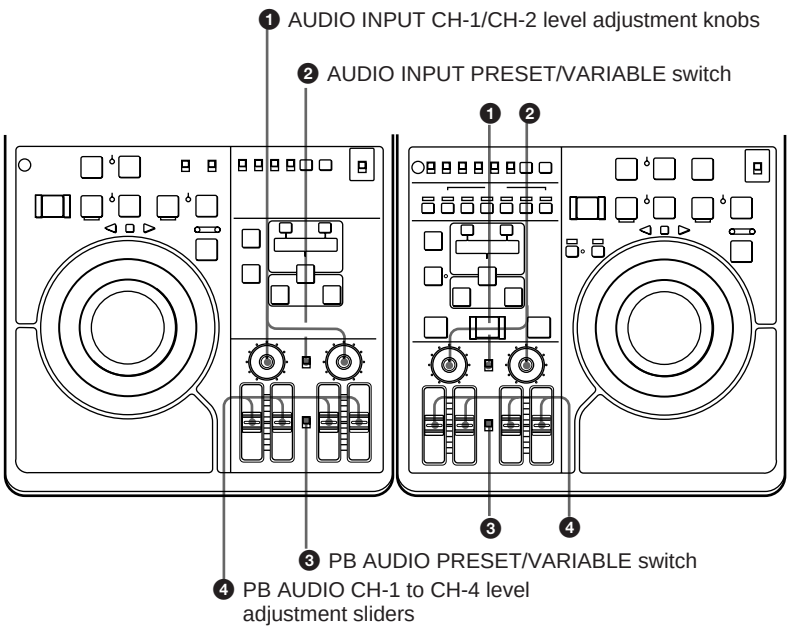
For details, see 3-5 "DMC Editing".

This button is also used to delete shot marks from the tape.

For details, see 5-2-5 "Deleting Shot Marks".

❿ AUDIO IN button
In insert editing, press this button together with the ENTRY/SHIFT button ❹ to set audio IN point separately from video IN point (audio split editing). After setting audio IN points, you can press this button to display them in the sub LCD.

Audio control section



❶ AUDIO INPUT CH-1/CH-2 level adjustment knobs

Make level adjustments by channel for analog input audio connected to the AUDIO INPUT CH-1/CH-2 connectors on the connector panel.

❷ AUDIO INPUT PRESET/ VARIABLE switch

Selects the audio input level adjustment function for analog audio connected to the AUDIO INPUT CH-1/CH-2 connectors on the connector panel.

PRESET: Preset to fixed levels. Levels cannot be adjusted with the level adjustment knobs.

VARIABLE: Levels adjustable with level adjustment knobs. This allows you to adjust the levels while viewing the audio level meters in E-E mode.

For more information about switching to E-E mode, see the descriptions of the REC (/SEQ) and EDIT buttons (page 1-9)

❸ PB AUDIO PRESET/ VARIABLE switch

Selects the level adjustment function for playback audio.

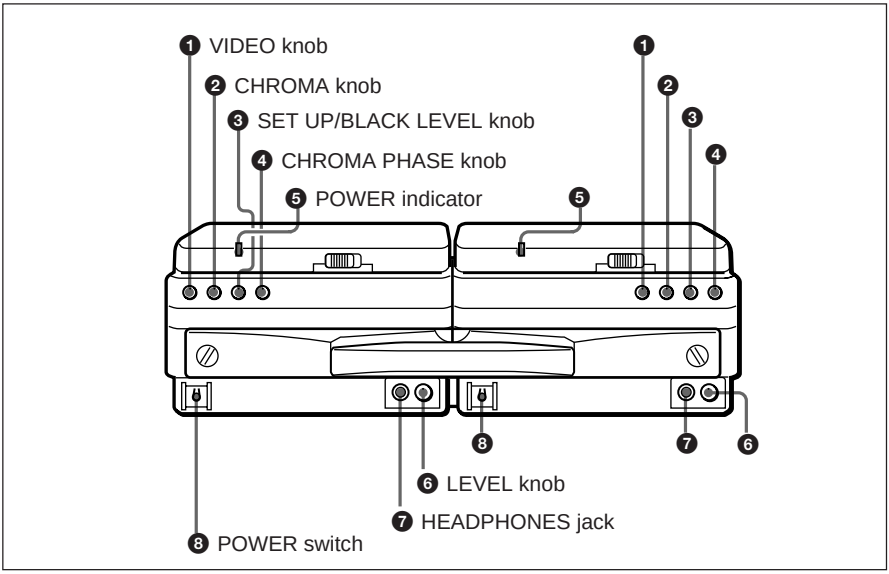
PRESET: Preset to fixed levels. Levels cannot be adjusted with the level adjustment sliders.

VARIABLE: Levels adjustable with the level adjustment sliders. This allows you to adjust the levels while viewing the audio level meter.

❹ PB AUDIO CH-1 to CH-4 level adjustment sliders

Make level adjustments by channel for playback audio channels 1 to 4.

1-3-3 Front Control Section



❶ VIDEO knob

Adjusts the video signal output level. This knob is a push switch. When you press it to bring it into the raised position, the setting becomes VARIABLE. When you press it again to depress it, the setting returns to PRESET.

PRESET: This is the normal setting. Regardless of the knob position, the video signal output level is set to the standard value.

VARIABLE: The video signal output level can be adjusted across a range of ±3 dB.

You can change the adjustment range by using setup menu item 714. For details, see page 6-28.

❷ CHROMA knob

Adjusts the chroma signal output level. This knob is a push switch. When you press it to bring it into the raised position, the setting becomes VARIABLE. When you press it again to depress it, the setting returns to PRESET.

PRESET: This is the normal setting. Regardless of the knob position, the chroma signal output level is set to the standard value.

VARIABLE: The chroma signal output level can be adjusted across a range of ±3 dB.

You can change the adjustment range by using setup menu item 714. For details, see page 6-28.

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❸ SET UP/BLACK LEVEL knob
Adjusts the setup level (in 525/60 mode) and the black level (in 625/50 mode). This knob is a push switch. When you press it to bring it into the raised position, the setting becomes VARIABLE. When you press it again to depress it, the setting returns to PRESET.

PRESET: This is the normal setting. Regardless of the knob position, the setup level is set to the standard value.

VARIABLE: The setup level can be adjusted across a range of ±30 IRE (in 525/60 mode) and the black level can be adjusted across a range of ±210 mV (in 625/50 mode).

❹ CHROMA PHASE knob
Adjusts the chroma phase (phase relative to burst). This knob is a push switch. When you press it to bring it into the raised position, the setting becomes VARIABLE. When you press it again to depress it, the setting returns to PRESET.

PRESET: This is the normal setting. Regardless of the knob position, the chroma phase is set to the standard value.

VARIABLE: The chroma phase can be adjusted across a range of ±30°.

❺ POWER indicator
Lights when the POWER switch ❽ is turned on.

❻ LEVEL (speaker/headphones level) knob
Adjusts the volume of the speaker or headphones connected to the HEADPHONES jack ❼.

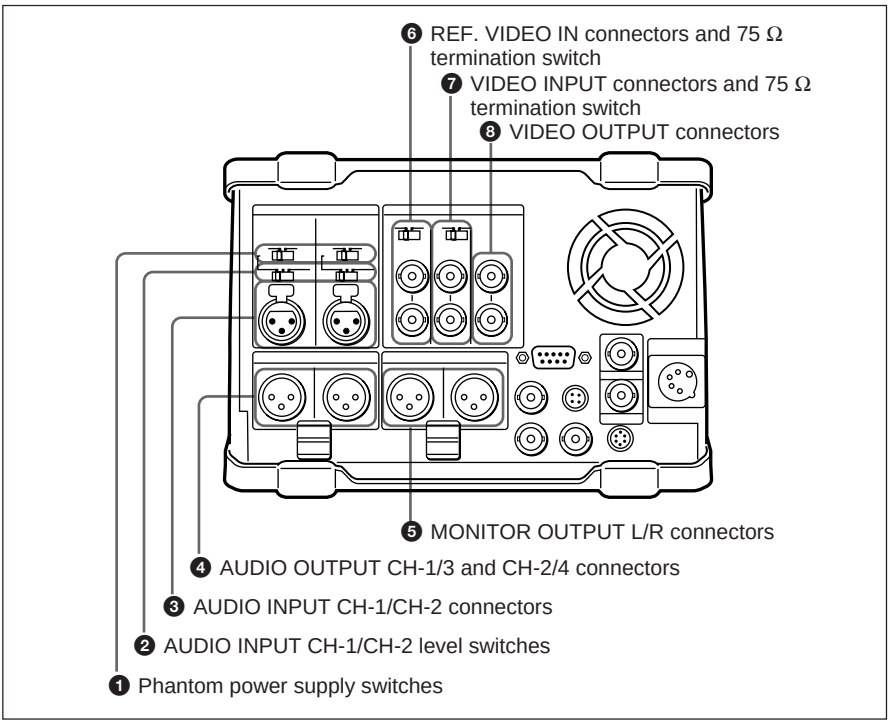
This knob can also adjust the level of the audio signal output from the MONITOR OUT connectors when MONITOR in the sub LCD menu is set to VAR. For details, see page 2-26.

❼ HEADPHONES jack
Connect headphones. The speaker is muted when headphones are connected.

❽ POWER switch
Powers the unit on and off. When the unit is powered, the POWER indicator ❺ lights.

1-3-4 Connector Panel

Analog audio/video input and output section



❶ Phantom power supply switches
When the AUDIO INPUT CH-1/CH-2 level switches ❷ are set to –60 dBu, phantom power is supplied to the AUDIO INPUT connectors when these switches are set to ON.

❷ AUDIO INPUT CH-1/CH-2 level switches
Select the input level of the analog audio signals of input channels 1 and 2.

–60 dBu: Microphone input
0 dBu: Line audio input
+4 dBu: Line audio input
(0 dBu = 0.775 Vrms)

❸ AUDIO INPUT CH-1/CH-2 connectors (XLR 3-pin, female)
Input the analog audio signals of input channels 1 and 2.

❹ AUDIO OUTPUT CH-1/3 and CH-2/4 connectors (XLR 3-pin, male)
Output the audio signals of the channels selected with the LINE OUT in the sub LCD menu. You can select two combinations of output signals: channels 1 and 2, or channels 3 and 4.

For more information about LINE OUT settings, see page 2-26.

Note
The level can be adjusted from the control panel, but mixed signals cannot be output.

❺ MONITOR OUTPUT L/R connectors (XLR 3-pin, male)
Output the audio signals of the channels selected with the MONITOR L/R in the sub LCD menu. The level is adjustable, and mixing is possible. Connect these connectors when you want to output mixed signals.

For more information about MONITOR L/R settings, see page 2-26.

You can also adjust the output level of the LEVEL knob in the front panel controls section with the MONITOR in the sub LCD menu. For details, see page 2-26.

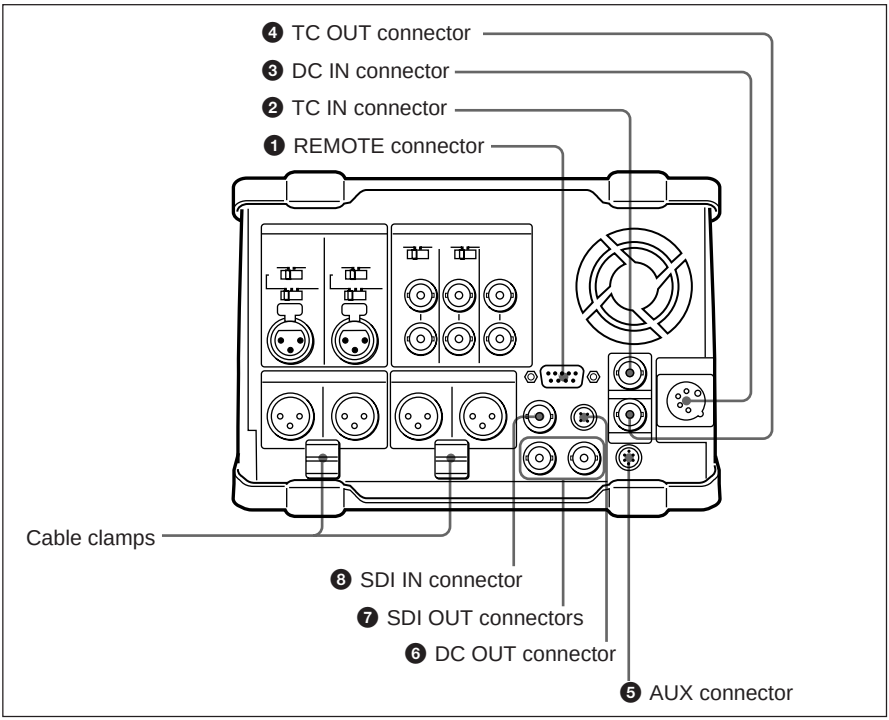
❻ REF. VIDEO IN (reference video signal input) connectors (BNC type) and 75 Ω termination switch
Input a video signal with color burst (VBS) or monochrome video signal (VS) as reference video signal. Set the 75 Ω termination switch to OFF when the signal is bridged, and to ON when the signal is not bridged.

❼ VIDEO INPUT (analog composite video input) connectors (BNC type) and 75 Ω termination switch
Input an analog composite video signal. Set the 75 Ω termination switch to OFF when the signal is bridged, and to ON when the signal is not bridged.

❽ VIDEO OUTPUT (analog composite video output) connectors (BNC type)
Output analog composite video signals. When the SUPER in the sub LCD menu is set to ALL or CPSTALL, timecode, menu settings, error messages and other information is superimposed on the output of connector 2 (SUPER).

For more information about SUPER settings, see page 2-31. For details about the superimposed information, see page A-11.

Digital signal/timecode/remote control/power input and output section



❶ REMOTE (9-pin remote control) connector (D-SUB 9-pin)
When editing with this unit, connect the player and recorder with the supplied 9-pin remote control cable. When editing with one of the VTRs in this unit and D-1, D-2, Betacam VTR, Digital Betacam VTR or other external equipment, connect the external equipment.

❷ TC IN (timecode input) connector (BNC type)
To record timecode from an external device, input the timecode from the external device's timecode output connector.

❸ DC IN (external power input) connector (XLR 4-pin, male)
To power this unit with AC power, connect to the DC output connector of the AC-550/550CE AC adaptor. You can also connect a BP-90(A) battery pack using the DC-210 Battery Adaptor.

Power supplied through this connector is used on a priority basic even when you have connected a battery pack or AC-DN2(A) AC Adaptor to the battery connector on the top panel.

For more information, see section 2-1 "Power Preparations".

❹ TC OUT (timecode output) connector (BNC type)
Outputs the following types of timecode, depending on the VTR operating status.

During playback: The playback timecode

During recording: The timecode generated by the internal timecode generator, or the timecode input through the TC IN connector.

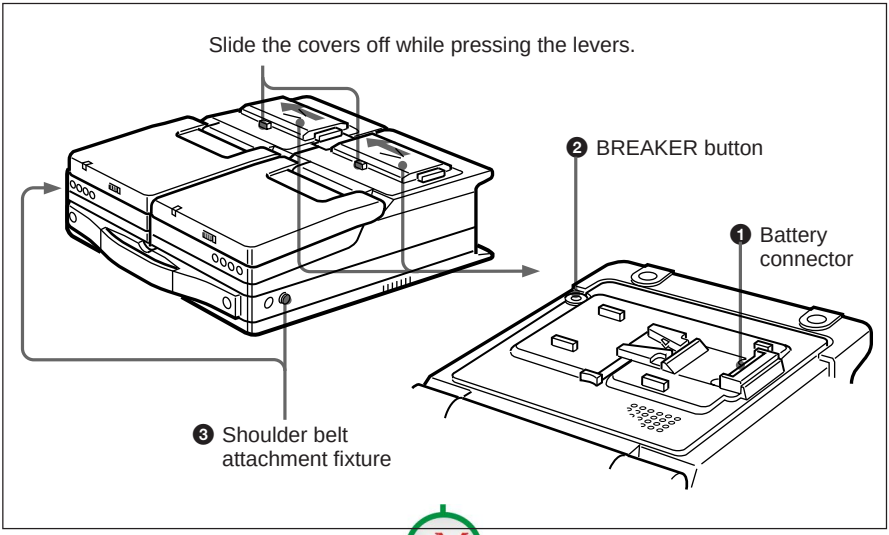
❺ AUX connector
This connector is used only for service.

❻ DC OUT connector
This connector supplies power to the BVR-3 Remote Control Unit.

❼ SDI OUT (serial digital interface output) connectors (BNC type)
Output a D-1 format video/audio signal. The same signals are output from the left and right connectors.

❽ SDI IN (serial digital interface input) connector (BNC type)
Input a D-1 format video/audio signal. Connect either of the SDI OUT connector ❼ on the player with this connector on the recorder to perform editing on this unit.

1-3-5 Top Panel



❶ Battery connector

Connect a BP-L60(A)/L90(A) Battery Pack, DC-L90 Battery Adaptor, or AC-DN2(A) AC Adaptor.
When the AC-550/550CE AC Adaptor or another power supply has been connected to the DC IN connector on the connector panel, the power from the DC IN connector is used instead of the power from this connector.

For more information, see section 2-1 "Power Preparations".

Note

It is impossible to use the AC-DN1 AC Adaptor.

❷ BREAKER button

When excess power flows inside the unit, breakers activate to protect the circuits by automatically shutting down the power. After inspecting and adjusting the unit, press these buttons. If there is no further trouble, the power will be restored.

❸ Shoulder belt attachment fixture

Attach the supplied shoulder belt.

For more information, see "Using the Shoulder Belt" in the Appendixes (page A-16).

2-1 Power Preparations

This unit can be powered by batteries or AC power.

Note

If you attach or remove batteries or AC adaptors incorrectly, they may fall down and cause body injury. Follow the procedures described below to attach or remove them.

2-1-1 Usable Batteries

Batteries that can be used with this unit are as follows. For each type of battery, a special battery adaptor and battery charger is required.

Battery	Battery Adaptor	Battery Charger
BP-90(A) (mounted on this unit)	DC-L90	BC-210/210CE/ 410/410CE
BP-90(A) (connected to DC IN connector)	DC-210	BC-210/210CE/ 410/410CE
BP-L60(A)/ L90(A)	Not needed	BC-L100/ L100CE/L50

Notes about battery usage

- Before using the batteries, be sure to charge them fully with the special battery charger. Refer to the operating instructions of your battery charger for more information about how to charge the batteries.
- Batteries may not be completely charged if you charge them immediately after use when they are still warm. You should wait until the batteries cool before charging them.

2-1-2 Using the BP-L60(A)/L90(A) Battery Pack

This unit can be operated for about 90 minutes at normal temperature on two fully charged BP-L90 Battery Packs.

To charge the battery pack

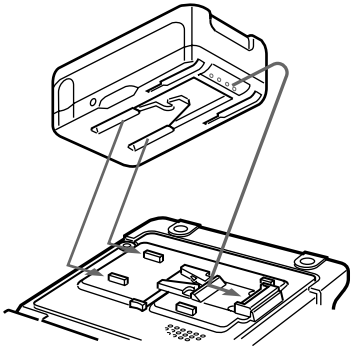
Before use, charge the battery pack with the BC-L100/L100CE Battery Charger. It takes about 2.5 hours to charge the BP-L60(A) and about 3.5 hours to charge the BP-L90(A).

For more information about how to charge the battery pack, refer to the manual for the BC-L100/L100CE.

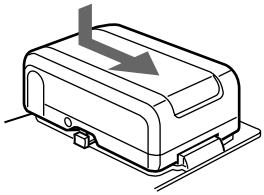
To attach the battery pack

Attach the BP-L60(A)/L90(A) as shown in the figure on next page. Before attaching, remove the cover of the battery connector.

Remove the cover in the same way that you remove the battery pack. For details see the next section "To remove the battery pack".



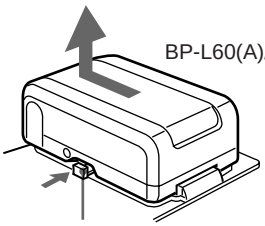
① Align the groove on the top panel of the BP-L60(A)/L90(A) with the guides.



② Slide the BP-L60(A)/L90(A) in so that its connector is firmly connected to the unit's battery connector.

To remove the battery pack

With the lever pushed in, slide the BP-L60(A)/L90(A) out.



2-1-3 Using the BP-90(A) Battery Pack

Different battery adaptors are used when mounting the BP-90(A) on the top panel of this unit and when connecting it the DC IN connector. This unit can be operated for about 60 minutes at normal temperature on a fully charged BP-90(A) Battery Pack.

To charge the battery pack

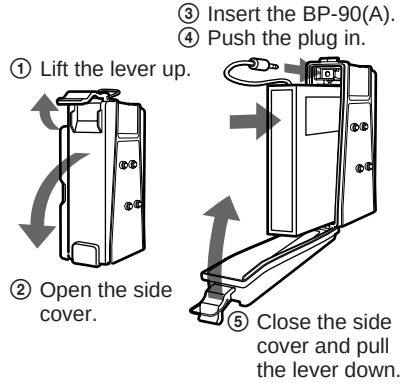
Before use, be sure to charge the battery pack with the BC-210/210CE/410/410CE Battery Charger. It takes about 2 hours to charge the BP-90(A).

For more information about how to charge the battery pack, refer to the manual for the BC-210/210CE/410/410CE.

To attach to the top panel of this unit

Use the DC-L90 Battery Adaptor.

1 Mount the BP-90(A) in the DC-L90.



2 Attach the DC-L90 to the top panel of this unit.

Use the same method that you use to attach the BP-L60(A)/L90(A). For details, refer to "To attach the battery pack" on page 2-1.

To connect to the DC IN connector

Use the DC-210 Battery Adaptor.

For more information about connections, refer to the operating instructions of the DC-210.

You can also connect another battery pack to the DC IN connector when a BP-90(A) battery pack is already mounted on the top panel of this unit. When you connect an external battery pack to the DC IN connector, the power supply automatically switches to the external battery pack from an internal battery pack mounted on the top panel of the unit.

Notes

- Noise may occur in video and audio signals at the moment when the unit switches from the internal to the external battery.
- It is always the external batteries connected to the DC IN connectors that serve as power supply. You cannot switch the power supply from the external batteries to the internal batteries while the external batteries are connected to the DC IN connector.

When an external battery pack is almost exhausted

If an internal battery pack is already mounted, disconnect the external battery pack by pulling its DC power cord out from the DC IN connector. If no internal battery back is mounted, disconnect the external battery pack after mounting a fully charged internal battery pack.

When an internal battery pack is almost exhausted

Connect a fully charged external battery pack to the DC IN connector, then exchange the internal battery pack.

2-1-4 Using AC Power

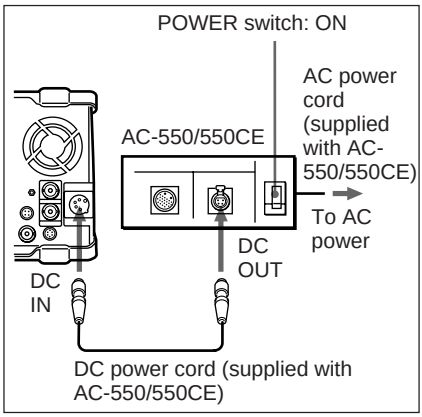
You can operate the unit from an AC power source by using the AC-550/550CE AC Adaptor or AC-DN2(A) AC Adaptor. Use the AC-550/550CE to connect the AC power source to the DC IN connector, and the AC-DN2(A) to connect the AC power source to the battery connector.

To use the AC-550/550CE

As shown in the figure, connect the AC-550/550CE to the AC power source and turn it on.
When you connect AC power, the power supply automatically switches to the AC power from a battery pack mounted on the top panel of the unit.

Note

Noise may occur in video and audio signals at the moment when the unit switches from the battery pack to AC power.

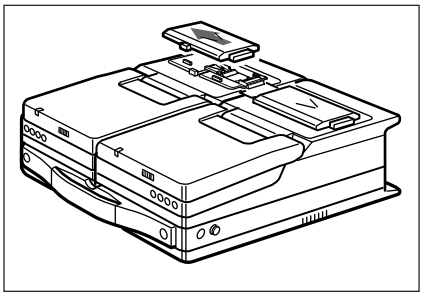


To use the AC-DN2(A)

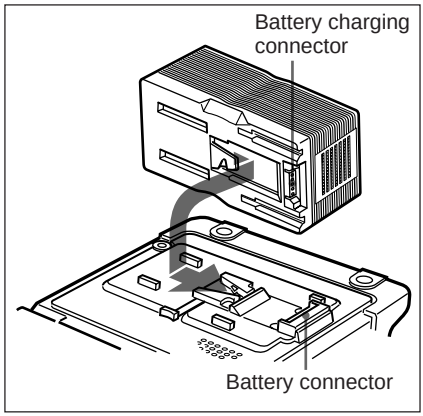
Follow the procedure below to mount the AC-DN2(A) on the top panel of this unit, and connect to AC power. You can supply the recorder and player with power by fitting a single AC-DN2(A) unit.

Here is explained the procedure for fitting the AC-DN2(A) to the player.

1 Remove the cover of the battery connector.



2 Insert the V-wedge shoe on the AC-DN2(A) in the V-groove on the player and slide the AC-DN2(A) until the battery charging connector is connected to the battery connector.



3 Use the DC cable (supplied with the AC-DN2(A)) to connect the DC output connector on the AC-DN2(A) and the DC IN connector on the rear of the recorder.
When the AC-DN2(A) is fitted to the recorder, connect the DC cable to the DC IN connector on the player.

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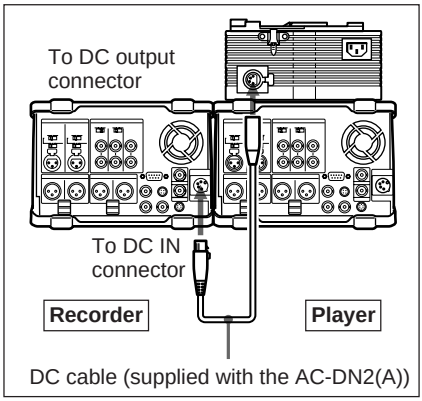
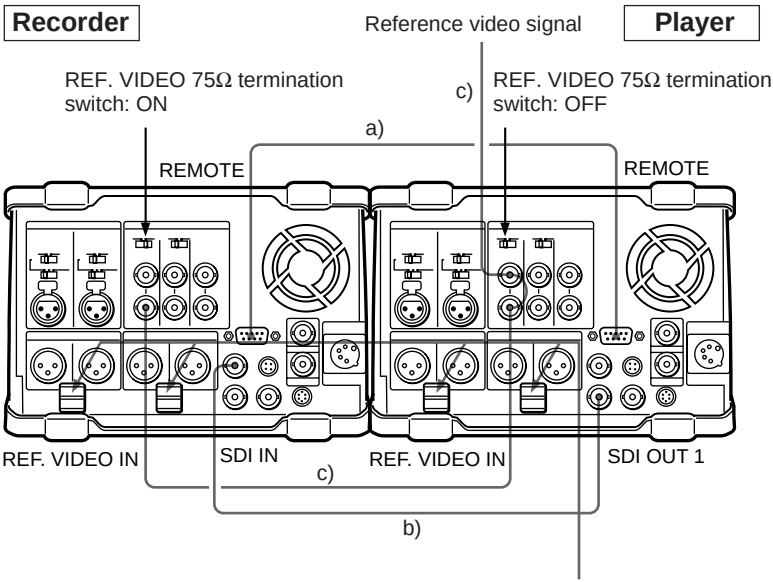


4 Supply the AC-DN2(A) with AC power.

For procedure on AC power supply to the AC-DN2(A), refer to the manual for the AC-DN2(A).

2-2 Connection

The figure below shows how to connect the player and recorder for editing.



a) 9-pin remote control cable (supplied)
b) 75 Ω coaxial cable with BNC plugs (supplied)
c) To input a reference video signal, connect a 75 Ω coaxial cable with BNC plugs (not supplied) and set the REF. VIDEO 75Ω termination switches as shown in the figure.

2-3 Handling Cassettes

To record with this unit, you can use half-inch width Betacam SX S cassettes, Betacam SP S cassettes (metal tape), or UVW S cassettes (metal tape).

Usable Cassettes

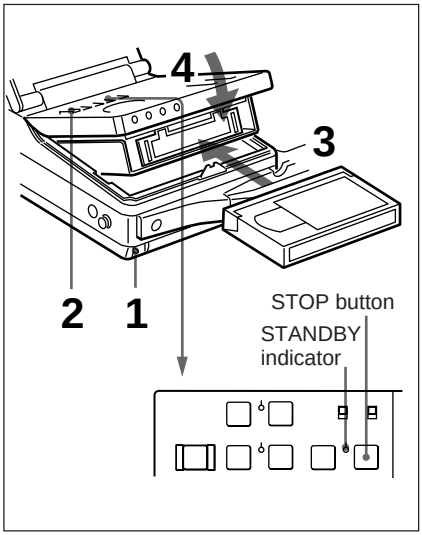
Betacam SX	BCT-12SX/22SX/32SX/60SX
Betacam SP (metal tape)	BCT-5MA/10MA/20MA/30MA
UVW (metal tape)	UVWT-10MA/20MA/30MA

Notes

- Digital Betacam cassettes cannot be used.
- Oxide tapes recorded in the Betacam format and metal tapes recorded in the Betacam SP format **can be only played back by the player**.

2-3-1 Loading/Ejecting Cassettes

To load a cassette



1 Set the POWER switch to ON.

2 Press the EJECT button.

The control panel lifts up and the cassette compartment opens.

3 Load a cassette in the direction shown in the figure after checking the following points.
- That “ERROR-10” is not displayed in the sub LCD.
- That there is no slack in the tape.

4 Close the control panel. (You should hear a click.)

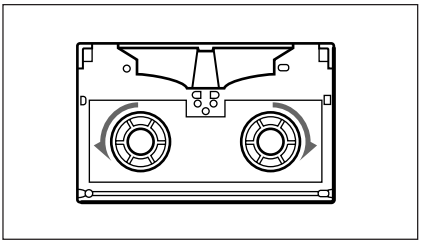
The STANDBY indicator lights.

If "ERROR-10" appears in the sub LCD

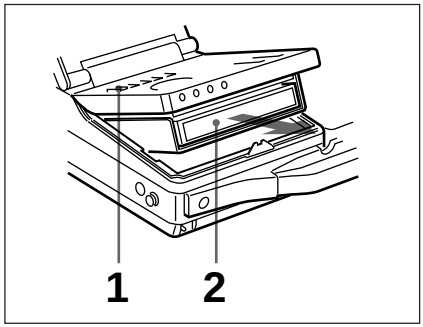
This means that there is condensation inside the unit.
For the steps to take in this case, see "Moisture Condensation" *(page A-2)*.

If there is slack in the tape

Take up the slack by rotating the reels in the directions shown by the arrows in the figure, keeping one reel fixed by pressing it with your finger as you rotate the other reel.
The reels stop rotating when there is no more slack.



To eject the cassette



1 With the unit powered on, press the EJECT button.

The control panel lifts up and the cassette compartment opens.

2 Remove the cassette and close the control panel.

Notes

- Do not shut the display panel while the control panel is still open. Doing so may damage the lock mechanism of the display panel.
- The EJECT cannot be used to eject a cassette when battery power falls to below about 9 V. Remove the cassette manually *(see next page)*.

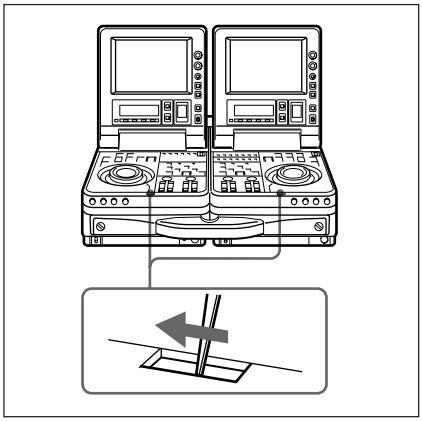
If there is no choice but to remove the cassette manually

Remove the cassette manually when battery power falls to below about 9 V.

Note

Power the unit off before removing the cassette manually. If the unit is powered, the drums may rotate and cause body injury.

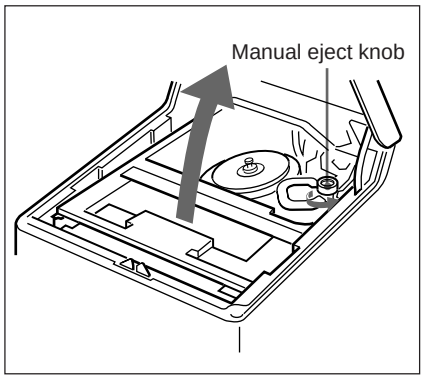
1 Using a tool such as tweezers, release the control panel lock.



2 Lift the control panel up, and press the manual eject knob (the red knob). Rotate the knob about 30 rotations in the counterclockwise direction while keeping it pressed down.

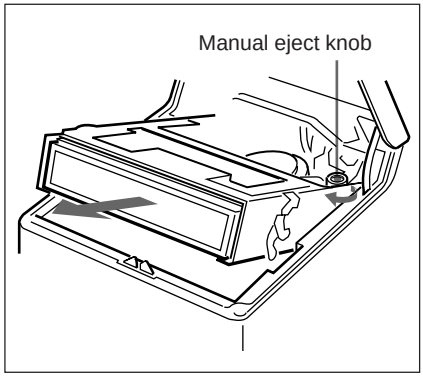
Note

Perform the operation carefully so that edges of internal parts will not injure your hand.



The cassette compartment rises up.

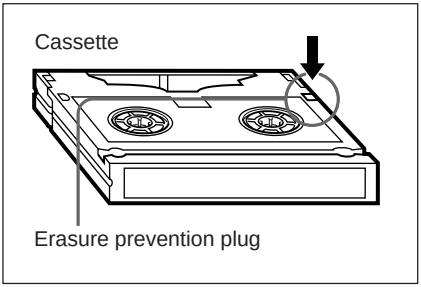
3 Remove the cassette, and rotate the manual eject knob 3 or 4 rotations in the clockwise direction while keeping it pressed down.



4 Close the control panel.

2-3-2 Preventing Accidental Erasures

To make it impossible to accidentally erase or record over the contents of a cassette, press in the erasure prevention plug. Return the plug to its original position when you want to record on the cassette again.



2-4 Setting Reference Video Signals

This section explains how reference video signals for synchronization of video output and servo lock are selected according to settings made with this unit.

Reference video signal for video output

Output video signals are synchronized with the signal generated by this unit's internal reference video signal generator. The internal reference video signal generator can be synchronized with an external reference video signal or with an input video signal (SDI or composite video).

Reference video signal for servo lock synchronization

Servo lock can be synchronized with an external reference video signal, with an input video signal (SDI or composite video), or with the signal generated by this unit's internal reference video signal generator.

As shown in the table below, a signal for synchronization of the internal reference video signal generator and a reference video signal for synchronization of servo lock are selected according to the setting of setup menu item 309, the setting of the OUT REF in the sub LCD menu, and the operating mode of the unit.

For more information about setup menu item 309, see page 6-16. For more information about the OUT REF, see page 2-29.

Setting	**Setting of setup menu item 309**	"AUTO (AUTO1/AUTO2)"		"EXT"
	OUT REF setting	"REF"	"INPUT"	–
Operating mode of this unit	**Recording** [a]	Input [d]	Input	Ref [c]
	Editing [b]	See below, "Reference video signals in editing"		
	Other	Ref		

a) During recording to tape.
b) When the assemble editing or insert editing mode has been selected.
c) Synchronize with external reference video signal (input to the REF. VIDEO IN connector).
d) Synchronize with input video signal (SDI or composite video), as selected with "source video signal" in the sub LCD menu (see page 2-21).

Reference video signals in editing

When the OUT REF is set to REF, the signal shown in the table below is selected, depending on whether setup menu item 309 is set to AUTO1 or AUTO2.

Note

Normally select AUTO1 and synchronize the external reference video signal with the input video signal.

Select AUTO2 when the external reference video signal is not synchronized with the input video signal. If you select AUTO1 under these conditions, noise may enter the video and audio signals, making editing difficult.

Setting of setup menu item 309	AUTO1	AUTO2
Synchronization signal for internal reference video signal generator	External reference video signal	Input video signal
Synchronization signal for servo reference video signal	Input video signal	

When the signal selected in the menu is not being input

The servo reference video signal and internal reference signal generator synchronize as follows.

When “Input” is selected for the sync signal (see note d) of the table on previous page)

When a video signal is not being input, synchronize with an external reference video signal.

When “Ref” is selected for the sync signal (see note c) of the table on previous page)

When an external reference video signal is not being input, there is no external synchronization. The servo reference video signal synchronizes with the output of the internal reference video signal generator.

2-5 Setting Timecode

There are four ways to record timecode.

	INT/EXT switch	PRESET/REGEN switch
(1)	INT	PRESET
(2)	EXT	REGEN
(3)	INT	REGEN
(4)	EXT	PRESET

(1) Record the output of the internal timecode generator with setting an initial value.
(2) Record the output of the internal timecode generator, which has been synchronized with an external timecode generator.
(3) Record the output of the internal timecode generator, which has been synchronized with playback timecode. (This method is always used during editing.)
4) Record the output of an external timecode generator without regeneration.

For more information about timecode generator settings, see the setup menu "Item 600 series: timecode generator settings" (page 6-20).

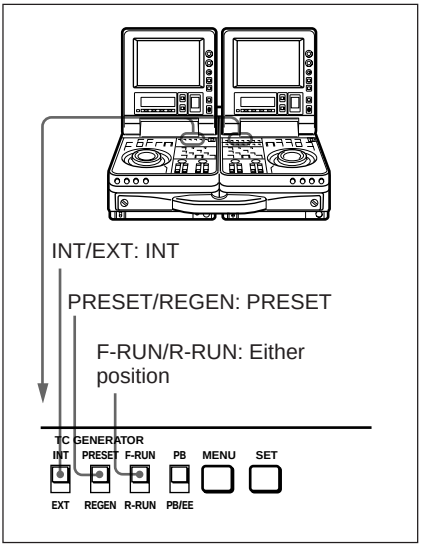
For more information about playback timecode settings, see page 4-4.

In addition to the INT/EXT switch and the PRESET/REGEN switch, the following settings are made with sub LCD menus.
• VITC ON/OFF: (home page)
• VITC/LTC/AUTO: (home page)
• DF/NDF (525 mode): (general settings page)

For more information about sub LCD menus, see section 2-6-1 "Displays on the Home Page of the Sub LCD Menu".

2-5-1 Setting an Initial Value and Recording Timecode

Set the switches and sub LCD menu items as shown below.

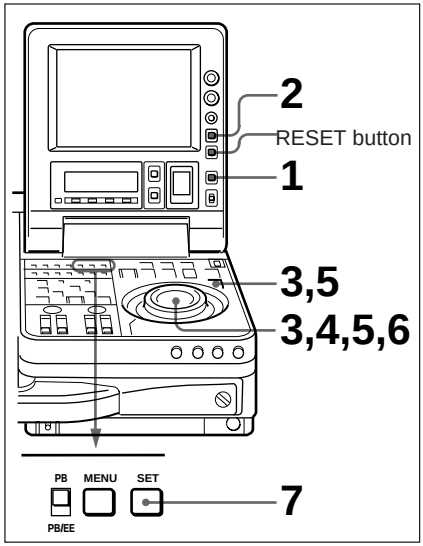


Sub LCD menu settings

Item	Setting
VITC ON/OFF (home page)	Desired setting (ON for recording)
VITC/LTC/AUTO (home page)	No setting required (ignored)
DF/NDF (general settings page)	Desired setting (in 525 mode)

To set an initial timecode value

Perform the following procedure.



1 Press the CTL/TC/U-BIT button and select TC.

2 Press the HOLD button.

The first digit of the time data (hours:minutes:seconds:frames) in the sub LCD begins to flash.

To set all digits to 0
Press the RESET button.

3 Confirm the JOG indicator lights, and select jog mode if not. (Shuttle mode is not recommendable.)

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4 Select the digit to set by rotating the jog dial.

The flashing digit changes to the digit on the right when you rotate the jog dial clockwise, and to the digit on the left when you rotate it counterclockwise.

5 Set the value for the flashing digit by rotating the jog dial while pressing the search button.

6 Repeat steps **4** and **5** until you finish setting all digits.

7 Press the SET button.

If the F-RUN/R-RUN switch is set to F-RUN, the timecode starts to advance immediately.

To set timecode to the current time

1 Set the F-RUN/R-RUN switch to F-RUN and the DF/NDF in the sub LCD menu to DF (in 525 mode only) *(see page 2-31)*.

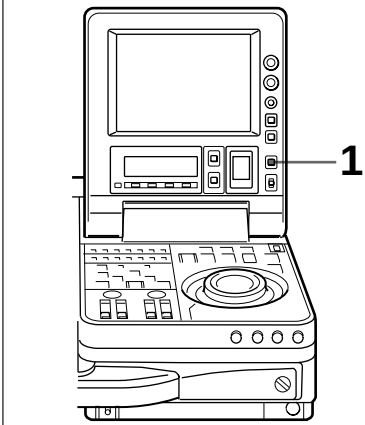
2 Carry out steps **1** to **6** of "To set an initial timecode value" to set the timecode to a time slightly ahead of the current time.

3 Press the SET button at the instant when the current time matches the displayed timecode.

To set user bits

You can record up to 8 hexadecimal digits of information (date, time, event number, etc.) in the timecode track.

Proceed as follows.



1 Press the CTL/TC/U-BIT button and select U-BIT.

2 Carry out steps **2** to **7** of "To set an initial timecode value".

Settings are made in hexadecimal (0, 1, 2,... 8, 9, A, B,... E, F).

You can record ID codes in user bits. For details, see setup menu items 603 and 604 (page 6-21).

2-5-2 Synchronizing the Internal Timecode Generator with an External Signal

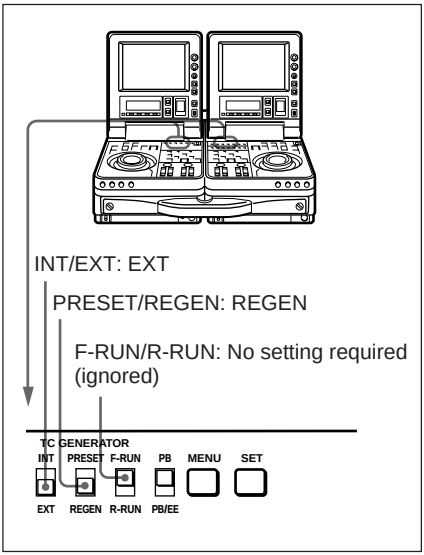
Use this method to synchronize multiple VTRs with an external timecode generator, and when you want to record the playback timecode signals of an external VTR without deterioration in the signal waveform. You can synchronize the internal timecode generator with either of the following kinds of external timecode.

- The output of an external timecode generator, or the timecode output (LTC) of an external VTR.
- The timecode (VITC) in an input video signal.

Proceed as follows.

1 **To synchronize with external timecode output (LTC):** Connect the output of an external timecode generator or the timecode output of an external VTR to the TC IN connector.
To synchronize with the timecode (VITC) of an input video signal: On the home page of the sub LCD menu, select the input signal containing the VITC.

2 Set switches and sub LCD menu items as follows.



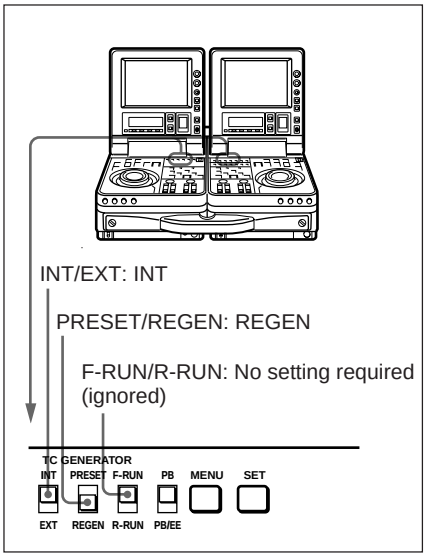
Sub LCD menu settings

Item	Setting
VITC ON/OFF (home page)	Desired position (ON when recording VITC)
VITC/LTC/AUTO (home page)	VITC or LTC, depending on which signal you want to synchronize with (LTC when set to AUTO)
DF/NDF (general settings page)	No setting required (ignored)

The internal timecode generator begins to run in synchronization with the external signal. Once external synchronization is achieved, the internal timecode generator continues to run even if you disconnect the external timecode generator.

2-5-3 Synchronizing the Internal Timecode Generator with Playback Timecode –Timecode Recording during Auto Editing

Set switches and sub LCD menu items as follows.



Sub LCD menu settings

Item	Setting
VITC ON/OFF (home page)	Desired position (ON when recording VITC)
VITC/LTC/AUTO (home page)	VITC or LTC, depending on which signal you want to synchronize with (LTC when set to AUTO)
DF/NDF (general settings page)	No setting required (ignored)

In automatic editing, timecode is recorded by using the output of the internal timecode generator, which has been synchronized during preroll with playback timecode read from the tape. For this reason, regardless of the actual settings of the INT/EXT and PRESET/REGEN switches, the unit operates as if the switches were set to INT and REGEN.

See setup menu item 610 (page 6-23) if you do not wish to have the INT/EXT and PRESET/REGEN settings fixed during automatic editing.

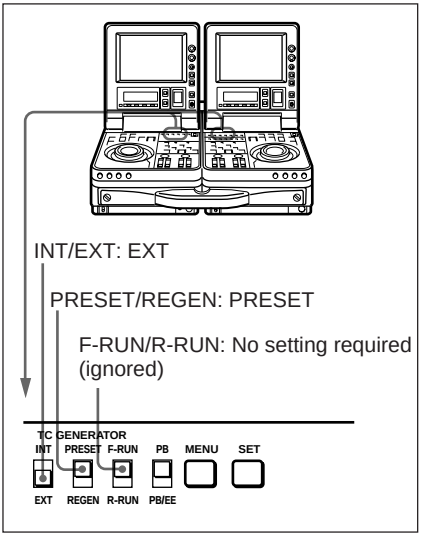
2-5-4 Recording External Timecode without Regeneration

When this method is used, the internal timecode generator is not affected by the external timecode. If you want to record the playback timecode of an external VTR, the method explained in section 2-5-2 “Synchronizing the Internal Timecode Generator with an External Signal” is recommended.

Proceed as follows.

1 Connect the timecode output of an external timecode generator to the TC IN connector when LTC or AUTO is selected in the home page of the sub LCD menu *(see page 2-19)*.

2 Set switches as follows.

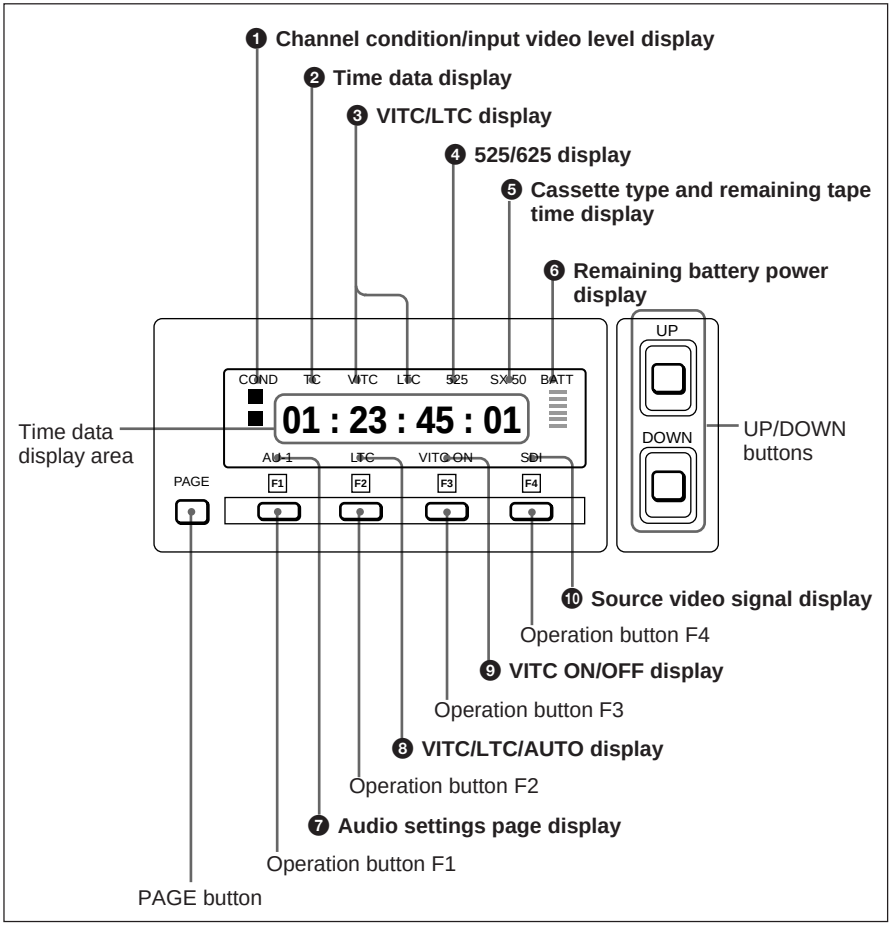


2-6 Sub LCD Menu

Information about the settings and operating status of the unit is displayed in the sub LCD.

2-6-1 Displays on the Home Page of the Sub LCD Menu

The home page of the sub LCD menu is displayed when you power the unit on.



❶ Channel condition/input video level display

Depending on the unit's operating status, one of the following is displayed here.

COND: Displayed during playback. The playback condition is displayed on a scale of three levels.

CONFI: Displayed during crash recording when the CONFI is set to ON on video settings page 1/2 *(see page 2-29)*. The playback condition of recorded signals is displayed on a scale of three levels.

VIDEO: Displayed in E-E mode. When using composite video, the video level is displayed on a scale of nine levels.

PRE-R: Displayed when PREREAD on video setting page 1/2 is set to ON. During playback, the playback condition is displayed on a scale of three levels. When using composite video in E-E mode, the video level is displayed on a scale of nine levels.

❷ Time data display

Displays the time data and its type.

TC: Timecode

UB: User bits

No display: CTL

❸ VITC/LTC display

Depending on the unit's operating status, one of the following is displayed here.

During playback: VITC when VITC timecode has been read, LTC when LTC has been read.

During recording: The timecode being recorded.

During E-E: The timecode to be recorded, when it has been read.

❹ 525/625 display

Displays 525 when the unit is being used as with the 525 system, and 625 when it is being used with the 625 system.

❺ Cassette type and remaining tape time display

Displays the type of cassette in use and its remaining time (in 2-minute increments).

SX: Betacam SX

SP: Betacam SP

OX: Oxide tape

– –: No cassette is loaded.

When the remaining time falls to 2 minutes or less, the indication becomes 0 and flashes together with the cassette type indication.

Note

When the player is playing back a Betacam SP cassette, the recording/playback format is displayed according to the setting of the SP TAPE switch on the control panel.

❻ Remaining battery power display

Displays the remaining battery power on a scale of seven levels. When the power is nearly exhausted, the BATT display flashes. When the power is completely exhausted, a flashing E (End) appears.

❼ Audio settings page display
To select one of the groups of the audio settings pages (AU-1 to AU-4) or MIX/SWP, press operation button F1 to highlight this display, then press the UP or DOWN button. The selected page in the group or the audio settings sub page appears when you press the PAGE button.

For details, see the next section, "To switch between menu pages".

❽ VITC/LTC/AUTO display
To select the type of timecode to use, press operation button F2 to highlight this display, then press the UP or DOWN button. If you select AUTO, the type of timecode is distinguished automatically during playback (VITC if the playback speed is within ±1/2) and set to LTC during recording.
You can switch to the general settings page by pressing the PAGE button after pressing operation button F2 to highlight this display.

For details, see the next section, "To switch between menu pages".

❾ VITC ON/OFF display
Set to ON to record VITC timecode. You can toggle the display between ON and OFF by pressing operation button F3 to highlight this display and then pressing the UP or DOWN button.
You can switch to the general settings page by pressing the PAGE button after pressing operation button F3 to highlight this display.

For details, see the next section, "To switch between menu pages".

❿ Source video signal display
You can select CMPST (composite) or SDI as the source video signal by pressing operation button F4 to highlight this display and then pressing the UP or DOWN button.
CMPST: Composite signal
SDI: SDI signal
If you press the PAGE button after highlighting this display, the video settings page appears, allowing you to make advanced settings.

For details, see the next section, "To switch between menu pages".

When you set SG on video setting page 1/2 to one of AUDIO, VIDEO, and BOTH *(see page 2-29)*, "SG" appears in this position.
If you press the UP or DOWN button with the SG indication highlighted, you can select one of the following: CMPST, SDI, and the option selected for "SG" on video setting page 1/2 (AUDIO, VIDEO, or BOTH).

2-6-2 Sub LCD Menu Basic Operations

To switch between menu pages

In addition to the home page, the sub LCD menu has pages that allow you to make settings for input and output of video and audio signals, and other general settings.
You can switch between pages by pressing the buttons shown in the figure on next page.

For more information about the video and audio settings pages, see section 2-7 “Input and Output Settings for Video and Audio Signals (Sub LCD Menu)”.

To select an item

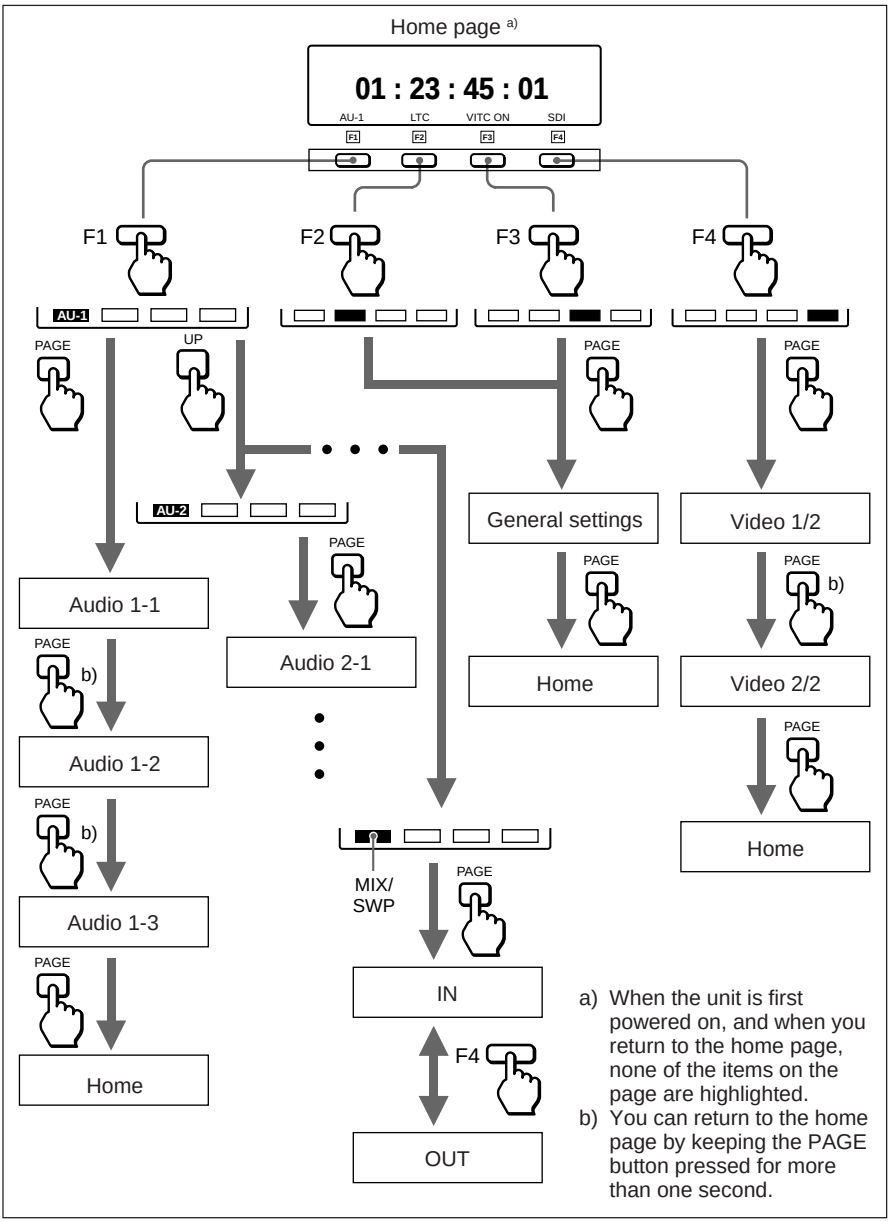
Display the page that contains the item you want to select, then press the operation button, F1 to F4, that is located in the same column as the item.

The selected item is highlighted. Press the button repeatedly until the item that you want to select is highlighted.

To change a setting

With the item that you want to change highlighted, press the UP or DOWN button.

The setting changes.
Press the UP or DOWN button repeatedly until the item is set to the value that you want.


Home page a)
01 : 23 : 45 : 01
AU-1
LTC
VITC ON
SDI
F1
F2
F3
F4
AU-1
AU-2
PAGE
UP
Audio 1-1
Audio 1-2
Audio 1-3
Audio 2-1
Home
General settings
Home
Video 1/2
Video 2/2
Home
b)
MIX/
SWP
IN
OUT
a) When the unit is first powered on, and when you return to the home page, none of the items on the page are highlighted.
b) You can return to the home page by keeping the PAGE button pressed for more than one second.

2-7 Input and Output Settings for Video and Audio Signals (Sub LCD Menu)

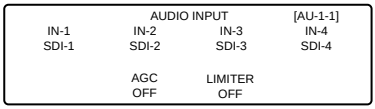
Using the sub LCD menu, you can make channel settings and adjust the input and output characteristics of video and audio signals.

For more information about basic sub LCD menu operations, see section 2-6-2 "Sub LCD Menu Basic Operations".

2-7-1 Making Settings in the Audio Settings Pages

The audio settings pages are divided into four groups, AU-1 to AU-4. To call up one of the settings pages in a group, select the group from the home page. Each settings page has a number that indicates its group and its position within the group. For example, audio settings page 1-1 is the first page in group AU-1.

Audio settings page 1-1



Item		Setting
AUDIO INPUT		Select the signals of audio input channels 1 to 4
	IN-1	SDI-1 or ANALOG 1
	IN-2	SDI-2 or ANALOG 2
	IN-3	SDI-3 or ANALOG 1
	IN-4	SDI-4 or ANALOG 2
AGC		Turn the audio input AGC circuits ON and OFF (enabled when the AUDIO INPUT PRESET/VARIABLE switch of the control panel is set to PRESET).
LIMITER		Turn the audio input limiter circuits ON and OFF (enabled when the AUDIO INPUT PRESET/VARIABLE switch of the control panel is set to VARIABLE).

To switch to audio settings page 1-2

Press the PAGE button.

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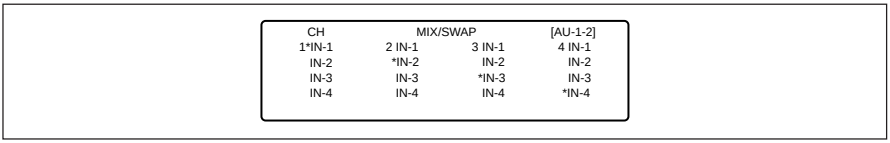
Audio settings page 1-2

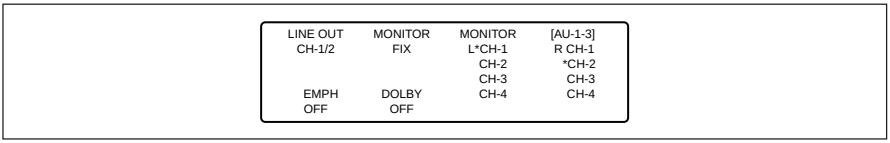


Item	Setting
MIX/SWAP CH 1 to 4	Select up to two audio input signals (IN-1 to IN-4) to be assigned to channels 1 to 4. When two signals are selected, they are mixed. **To select** Select the channel using operation buttons F1 to F4, and press the UP or DOWN button to add asterisks to the position of the desired input signal.

To switch to audio settings page 1-3

Press the PAGE button.

Audio settings page 1-3



Item		Setting
LINE OUT		Select channels 1/2 or 3/4 as the line out channels.
MONITOR		Select FIX for an output level determined according to the setting (either PRESET or VARIABLE) of the PB AUDIO PRESET/VARIABLE switch of the control panel, or VAR for an output level linked also to the LEVEL knob on the front control section.
MONITOR		Select monitor output L and R signals (up to four). **To select** Select channel for L using operation button F3 and channel for R using operation button F4, and press the UP or DOWN button to add the asterisk to the position of the desired channel.
	L	Select from channels 1 to 4.
	R	Select from channels 1 to 4.
EMPH		Set to ON when you want to add emphasis.
DOLBY		When playing back oxide tapes recorded in Betacam format, set to ON or OFF to match the Dolby[a)] setting at the time of recording.

a) Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation. "DOLBY" and the double-D symbol ⧏⧐ are trademarks of Dolby Laboratories Licensing Corporation.

Audio settings pages 2-1 to 4-3

Make settings in the same way as pages 1-1 to 1-3.

2-7-2 Making Settings in the Audio Settings Subpages

Use the audio settings subpages to make mix and swap input and output settings for channel 1 and channel 2.

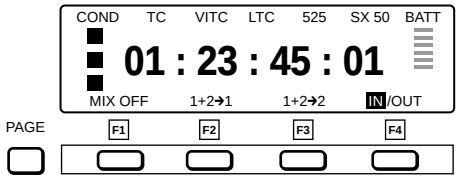
To display the audio settings subpages

1 Press operation button F1 to highlight the audio settings item in the home page.

2 If the item displayed is not "MIX/SWP", press the UP button until "MIX/SWP" appears.

3 Press the PAGE button.

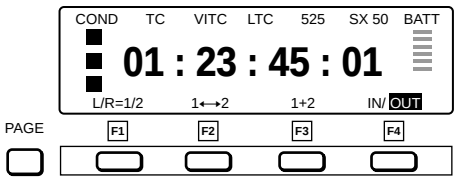
An audio settings subpage (input mixing page) appears as shown below (next page).



To switch pages

Press the F4 button.

An output monitor settings page like the one below appears.



Each press of the F4 button switches between the input mixing settings page and the output monitor settings page.

To return to the home page

Press the PAGE button.

Contents of the audio settings subpages

When you change the settings of the audio settings subpages, the settings of the AU-1 page change as well, and vice versa.
However, when there is no item in the subpages corresponding to a setting made in the AU-1 page, the setting is not reflected in the subpages.

Input mixing settings page

By pressing operation buttons F1 to F3, you can make the following three settings for mixing of input signals in audio channels 1 and 2. The selected setting is highlighted. To select input signals, use audio settings page 1-1.

MIX OFF: Assign IN-1 to channel 1, and assign IN-2 to channel 2.

1+2 → 1: Assign mixed signals of IN-1 and IN-2 to channel 1, and assign IN-2 to channel 2.

1+2 → 2: Assign IN-1 to channel 1, and assign mixed signals of IN-1 and IN-2 to channel 2.

Output monitor settings page

By pressing operation buttons F1 to F3, you can make the following three settings for left and right monitor output signals. The selected setting is highlighted.

L/R=1/2: Assign channel 1 to monitor output L (left), and assign channel 2 to monitor output R (right).

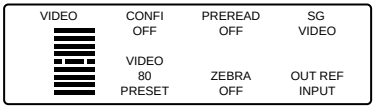
1 ↔ 2: Assign channel 2 to monitor output L, and assign channel 1 to monitor output R.

1+2: Assign mixed signals from channels 1 and 2 to monitor output L and R.

2-7-3 Making Settings in the Video Settings Pages

The following tables show the items that can be set in the video settings pages.

Video settings page 1/2

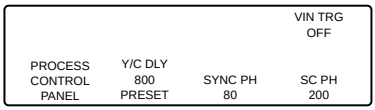


Item	Setting
SG	Select the output of the internal audio or video signal generator for the source signal. OFF: Neither of the output of the internal audio nor video signal generator AUDIO: The output of the internal audio signal generator, as selected with setup menu item 808 (see page 6-32), for all audio channels VIDEO: The output of the internal video signal generator, as selected with setup menu item 710 (see page 6-26) BOTH: Both of the outputs of the internal audio and video signal generators
CONFI	Select whether or not to carry out CONFI playback during crash recording. OFF: No CONFI playback ON: CONFI playback **Note** In insert or assemble editing, CONFI playback is not possible.
PREREAD	Select whether or not to carry out preread editing. OFF: No preread editing ON: preread editing
VIDEO IN	Set the input level of composite video input signals. PRESET: Fixed at factory default level. VAR: Adjustable as desired. **To adjust** The current input level is displayed when you select VAR. Press the UP or DOWN button to change the displayed value. Adjust so that the input video level display bar is close to the center.

(Continued)

Item	Setting
ZEBRA	Set the zebra pattern to be displayed in the LCD monitor. OFF: Do not display. 50%: Display zebra pattern with 50% or morevideo level. 80%: Display zebra pattern with 80% or more video level. 100%: Display zebra pattern with 100% or more video level.
OUT REF (See page 2-11 for details.)	Select the signal to which the internal reference video signal generator is synchronized. REF: Synchronize with the signal input to the REF. INPUT connector. INPUT: Synchronize with the signal selected in the home page (composite video signal or SDI signal).

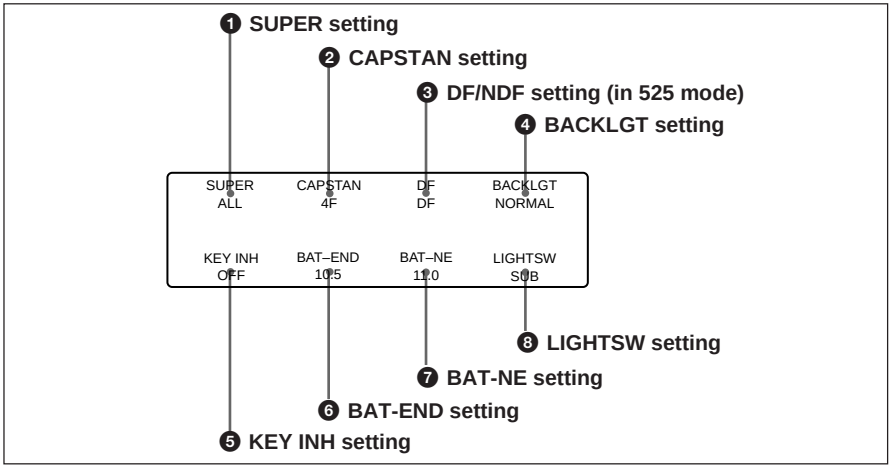
Video settings page 2/2



Item	Setting
PROCESS CONTROL	Select SETUP when you want to adjust the following items with the setup menu, and PANEL when you want to adjust them with the sub LCD menus and the front control panel. • Output video level • Chroma output level • Setup level (525/60 mode) • Black level (625/50 mode) • Chroma phase • Y/C delay (player only) • Sync/subcarrier phase
Y/C DELAY (player only)	When the “PROCESS CONTROL” is set to PANEL, set the Y/C delay value. PRESET: Fixed at factory default level. VAR: Adjustable as desired. **To adjust** Press operation button F4 to indicate the VAR, press F4 again to highlight the value, and then press the UP or DOWN button to change the value.
SYNC PH	When the “PROCESS CONTROL” is set to PANEL, adjust the sync phase by pressing the UP or DOWN button.
SC PH	When the “PROCESS CONTROL” is set to PANEL, adjust the subcarrier phase by pressing the UP or DOWN button. The SC-H value is constant.
VIN TRG	Select whether or not to output a GPI signal from pin 5 of the AUX connector at the IN points of a video auto-edit (excluding audio split editing). OFF: Do not output a GPI signal. ON: Output a GPI signal.

2-8 General Settings Page of the Sub LCD Menu

The general settings page contains the items shown below.



❶ SUPER (superimpose) setting

Set to either of ALL, LCDMENU, or CPSTALL to specify output of superimposed text.

When set to ALL

	Output to LCD monitor	Output to VIDEO OUT 2 (SUPER) connector
Time data	Yes	Yes
Menus	Yes	Yes
Error messages/ Shot Mark list	Yes	Yes

When set to LCDMENU

	Output to LCD monitor	Output to VIDEO OUT 2 (SUPER) connector
Time data	No	No
Menus	Yes	No
Error messages/ Shot Mark list	Yes	No

When set to CPSTALL

	Output to LCD monitor	Output to VIDEO OUT 2 (SUPER) connector
Time data	No	Yes
Menus	No	Yes
Error messages/ Shot Mark list	No	Yes

For details about the information displayed, see “To display superimposed text information” (page A-11).

❷ CAPSTAN (capstan lock) setting
Set the capstan servo lock mode.

2F: Lock the capstan servo on 2 fields. When performing picture shift under the 525 system, set setup menu item 712 to ON *(see page 6-27)*.

4F: Lock the capstan servo on 4 fields.

8F: Lock the capstan servo on 8 fields (625 system only).

❸ DF/NDF setting (in 525 mode)
Select DF to advance timecode in drop-frame mode, and NDF to

❹ BACKLGT (back light) setting
Set to HIGH to increase the brightness of the LCD monitor back light.

❺ KEY INH (key inhibit) setting
Set to ON to disable the buttons on the control panel. (Sub LCD menu operations can still be performed even when this item is set to ON.)
You can select the buttons that are disabled under setup menu item 118 *(see page 6-12)*.
If you try to operate the disabled buttons, the message "!!KEY INH.!" appears in the time data display area on the sub LCD.

❻ BAT-END (battery end) setting
Set a voltage value to indicate the shutdown voltage of this unit depending on the batteries you are using.

❼ BAT-NE (battery near end) setting
For alarms that alert you when the end of power as specified in the battery end setting ❻ is near, specify a voltage that at which to begin the alarm display.

❽ LIGHTSW (backlight control switch) setting
Controls back light power of the LCD monitor and sub LCD.

SUBMAIN: The both are controlled by the LIGHT switch.

MAIN: The LCD monitor back light power is controlled by the LIGHT switch. The sub LCD back light power is continually on.

SUB: The sub LCD back light power is controlled by the LIGHT switch. The LCD monitor back light power is continually on.

3-1 Selecting an Edit Mode

You can do two types of editing on this unit: assemble editing and insert editing. This section provides an outline of each type and explains how to select an edit mode.

3-1-1 Assemble Editing

In assemble editing, you record video and audio materials in order from the start of the tape. In addition to video, audio, CTL and timecode are recorded. If timecode is already recorded on the tape, the new timecode is recorded so as to form a continuous sequence with the existing timecode.
Assemble editing is convenient when you are recording on a new tape.

Note

Before you begin assemble editing for the first time with a new tape, video signal such as black signal, CTL and timecode must be recorded on the tape in advance of the recorder IN point for a length equal to or greater than the preroll time.

Selecting assemble mode

1 Press the RECORDER button on the recorder control panel.

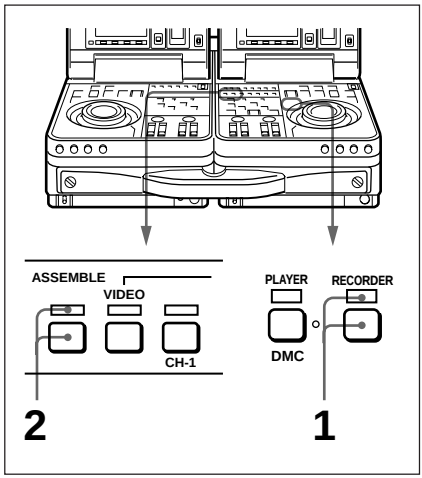
The RECORDER indicator lights.

2 Press the ASSEMBLE button on the recorder control panel.

The ASSEMBLE indicator lights.

To cancel assemble mode

Press the ASSEMBLE button again to turn the ASSEMBLE indicator off.



3-1-2 Insert Editing

In insert editing, you insert video, audio, and timecode at desired positions on an already recorded tape. You can insert all three types of data at the same time, or insert one of the types separately. For audio, you can select multiple channels from among channels 1 to 4. Use insert editing when you want to do the following:

- Replace video and audio on unneeded sections of the tape with other video and audio.
- Insert music and narration into a tape with edited video.
- Insert video into a tape with edited audio.
- Record new timecode over already recorded timecode.

Note

Before you use an unrecorded tape in insert editing, video signal such as black signal, CTL and timecode must be recorded on all over the tape.

Selecting insert mode

1 Press the RECORDER button on the recorder control panel.

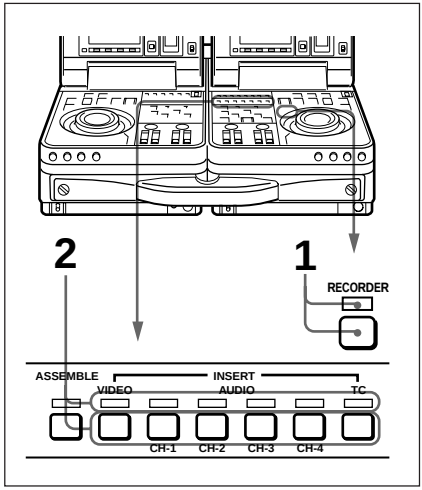
The RECORDER indicator lights.

2 Press one or more of the INSERT buttons on the recorder control panel to select the signals you want to insert.

The corresponding INSERT indicators light.

To cancel insert mode

Press the lit INSERT buttons again to turn the corresponding indicators off. Selection of a signal is canceled when its indicator goes out.



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3-2 Finding Edit Points – Search

Playback in search mode using the jog and shuttle dials allows finding edit points quickly.
On this unit, you can perform search in the following three modes: jog, shuttle and variable

Jog mode

Playback speed is determined by the rotation speed of the jog dial between ±1 times normal speed. Rotate the dial in the clockwise direction to search in the forward direction, and rotate the dial in the counterclockwise direction to search in the reverse direction.

Shuttle mode

Playback speed is determined by the rotation angle of the shuttle dial between ±24 times normal speed (21 steps). Click points allow playback at ±5 times normal speed. Rotate the dial in the clockwise direction to search in the forward direction, and rotate the dial in the counterclockwise direction to search in the reverse direction.
When using the cassette recorded in Betacam/Betacam SP format (player only), the playback speed range is between ±10 times normal speed (19 steps).

Variable mode

Playback speed is determined by the rotation angle of the shuttle dial between ±1 times normal speed (47 steps). Rotate the dial in the clockwise direction to search in the forward direction, and rotate the dial in the counterclockwise direction to search in the reverse direction.
When using the cassette recorded in Betacam/Betacam SP format (player only), the playback speed range is the same, but noiseless playback is not possible.

Switching between each mode

Lighting the JOG or SHUTTLE indicator shows the corresponding mode is selected. Lighting both the JOG and SHUTTLE indicators shows the variable mode is selected.

Switching from jog to shuttle or variable mode

Rotate the shuttle dial.

Switching from shuttle or variable to jog mode

Press the jog dial or rotate the jog dial while setting the shuttle dial at still position.

Switching from shuttle or jog to variable mode

Press the search button for 1 or more seconds.

Switching from variable to shuttle mode

Press the search button for 1 or more seconds.

To switch between normal playback and search modes

Press the PLAY and search buttons alternately.

As factory default setting, rotating the jog or shuttle dial switches to search mode at any time except during recording and editing.
If you change the setting of setup menu item 101, the above function will be disabled and switching to search mode will be possible only when the search button is pressed.

For details about setting, see item 101 on page 6-11.

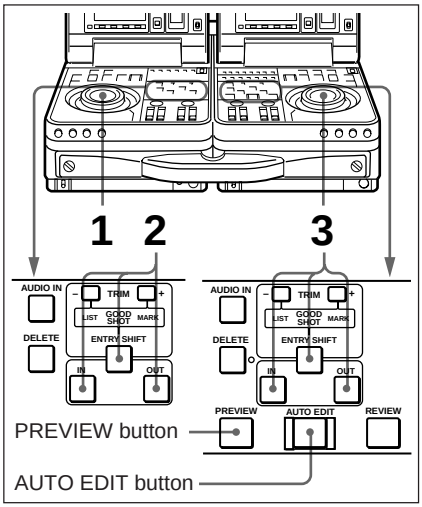
3-3 Setting Edit Points

In editing operations, there are four edit points: an IN point and an OUT point on the recorder side, and an IN point and an OUT point on the player side. As soon as you set three of the edit points, the fourth edit point is calculated automatically.
In insert editing, you can set IN points for audio separately from the IN points for video (audio split editing).

For details, see "To set audio IN points separately from video IN points (audio split editing)".

3-3-1 Setting Edit Points

Proceed as follows to set edit points.



1 Rotate the player side jog or shuttle dial to find the player edit points.

For details about jog/shuttle dial operations, see 3-2 "Finding Edit Points – Search".

2 Press the IN button together with the ENTRY/SHIFT button at the point you want to set as the IN point. Press the OUT button together with the ENTRY/SHIFT button at the point you want to set as the OUT point.

The IN and OUT points are set, and the IN and OUT buttons light.

3 Repeat steps **1** and **2** on the recorder side to set the recorder IN or OUT point.

As soon as you set three edit points on the player and recorder, the PREVIEW button and the AUTO EDIT button light to indicate that you can conduct a preview or edit.

Note

If you set four or more edit points on the player and recorder, the DELETE button flashes. You cannot conduct an edit when the unit is in this state. Delete the unneeded edit points.

For details, see 3-3-5 "Modifying Edit Points".

To set audio IN points separately from video IN points (audio split editing)

In insert editing, press the AUDIO IN button together with the ENTRY/SHIFT button at the point you want to set as the audio IN point.

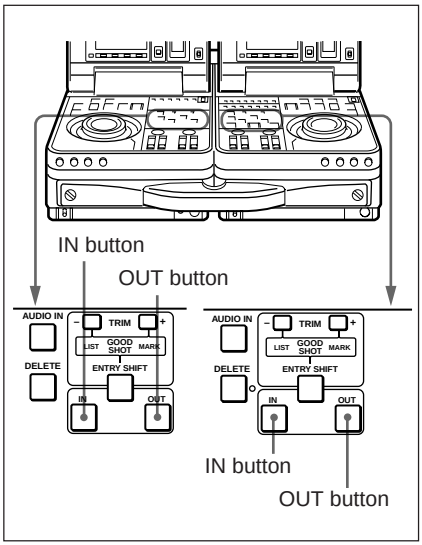
The audio IN point is set and the AUDIO IN button lights.

3-3-2 Checking Edit Points

You can check the time data of edit points and the duration between two edit points by displaying them in the sub LCD.

To display the time data of edit points

Press the recorder side or player side IN or OUT button.



While the button remains pressed, the time data for the corresponding edit point is displayed in the sub LCD.

To display the duration between two edit points

From among the recorder and player IN buttons (or AUDIO IN buttons) and OUT buttons, press two of the buttons together.

The duration appears in the sub LCD while the buttons are kept pressed. In some cases, negative durations preceded by a minus sign (–) may be displayed.

The displayed durations are calculated as follows.

When two edit points are set: The duration between the two edit points

When only one edit point is set: The duration between the edit point and the current tape position

When no edit points are set: The duration of the most recently set edit points

3-3-3 Cueing Up Edit Points

You can cue up any edit point, or cue up a position located a specified amount of time before the edit start point (preroll).

To set the preroll time

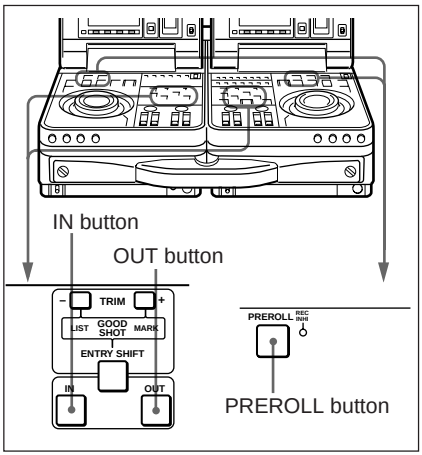
Using the setup menu item 001, specify how many seconds (the preroll time) in advance of the edit start point to set the preroll point.
The factory default preroll time is 5 seconds.

For details, see page 6-2.

Use the following procedures to cue up an edit point or preroll the tape.

To cue up an edit point

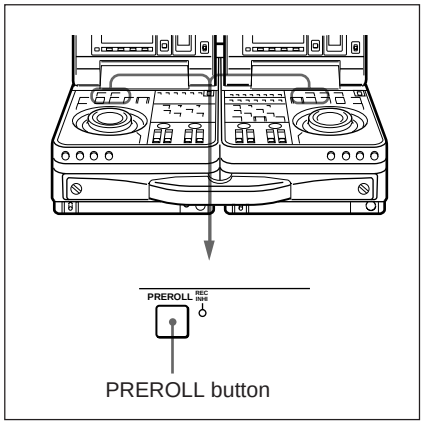
Press and hold the recorder or player IN or OUT button, and press the recorder or player PREROLL button while holding the IN or OUT button.



The tape runs to the IN point or OUT point and stops.

To preroll the tape

Press the recorder or player PREROLL button.

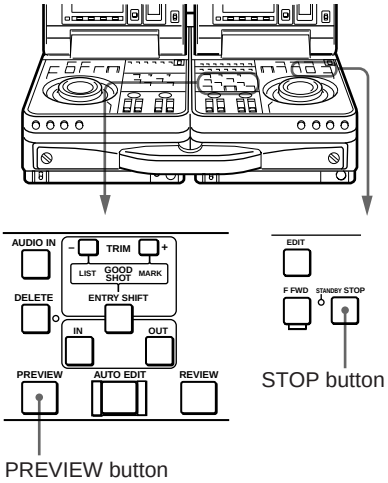


The tape runs to the preroll point, located in advance of the edit start point by the specified amount of time, and then stops.

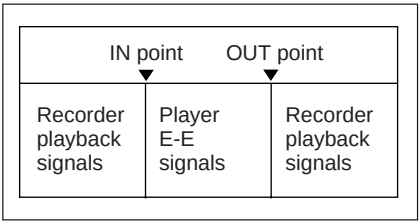
3-3-4 Previewing Edit Results

When you finish setting the edit points, the PREVIEW button flashes to indicate that you can conduct a preview.

To conduct a preview, press the recorder PREVIEW button, turning it on.



During the preview, you can see the video in the recorder side LCD monitor and listen to the audio through the recorder side speaker. The figure below shows the video and audio signals which can be monitored.



After the preview, modify, delete, or reset edit points as required.

For more information about modifying edit points, see section 3-3-5 "Modifying Edit Points".

To stop a preview

Press the STOP button on the recorder.
The tape stops when the button was pressed.

3-3-5 Modifying Edit Points

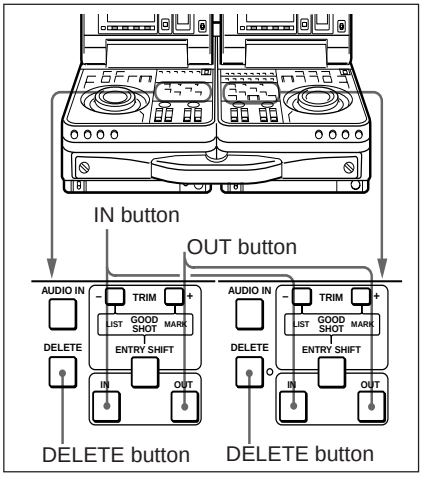
Once you set edit points, you can delete them or modify them as required in units of one frame.
When edit points have been set incorrectly, for example when an OUT point is located before an IN point or when the durations of editing segments on the player and recorder do no match, the DELETE buttons flash to alert you that a preview or edit cannot be conducted. Correct the edit points as required.

To turn a flashing DELETE button off without deleting an edit point

Press the DELETE button.

To deleting an edit point

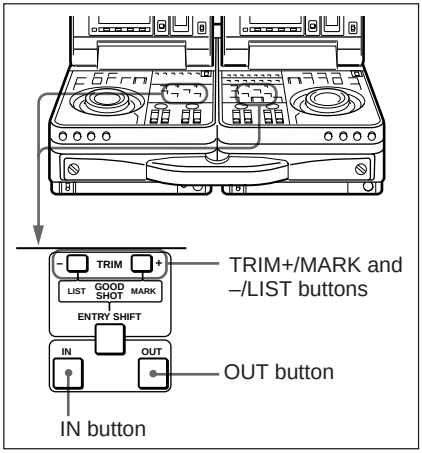
Proceed as follows.



Press the flashing DELETE button together with the IN button or the OUT button.

The DELETE button stops flashing, and the edit point is deleted.

To modify edit points slightly



1 While pressing the recorder or player IN or OUT button, depending on the edit point that you want to modify, press a TRIM button (+/MARK or –/LIST) on the same side of the control panel.

The edit point time data is displayed.
Each time you press the +/MARK button, you advance one frame, and each time you press the –/LIST button you return one frame.

2 After making the modifications, press the IN or OUT button that you pressed in step **1**.

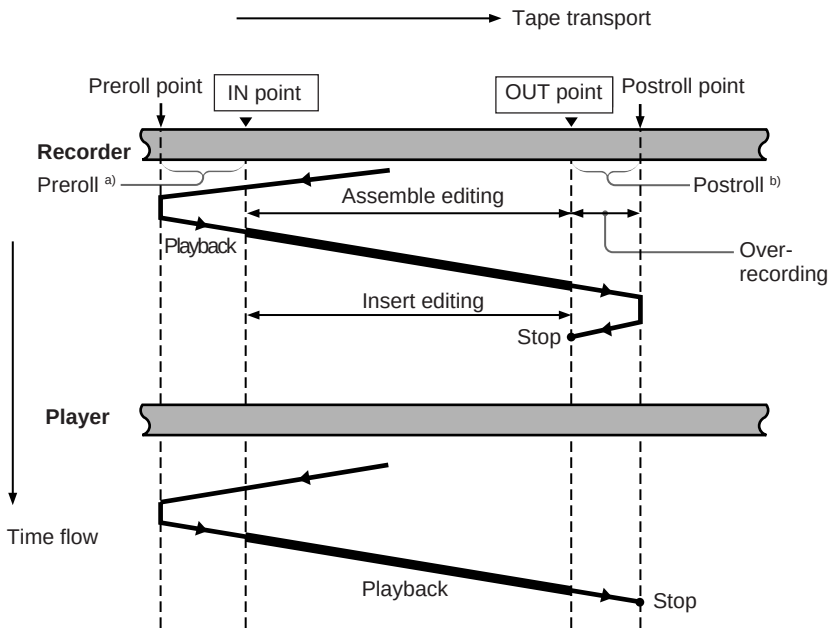
3-3-6 Setting Edit Points Using the Recorder Only

If you press the PLAYER/DMC button to light the PLAYER/DMC indicator on the control panel, you can operate the player or an external VTR with the recorder side buttons, and set edit points.
When you do this, we recommend that you inhibit the buttons on the player side of the control panel to prevent unintended operations. To inhibit the player side buttons, set the “KEY INH” to ON in the sub LCD menu *(see page 2-32)*.

3-4 Executing an Edit

3-4-1 Outline of Editing Operations

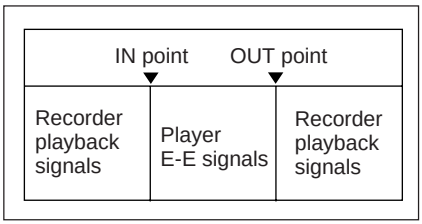
The figure below shows how the recorder and player operate during edit.



a) The factory default preroll time is 5 seconds. You can use the setup menu item 001 to set a time from 0 to 30 seconds (see page 6-2).
b) The postroll time is set to 2 seconds.

Monitoring signals during an edit

Just as during a preview, you can see the video in the recorder side LCD monitor and listen to the audio through the recorder side speaker. The figure below shows the video and audio signals which can be monitored.

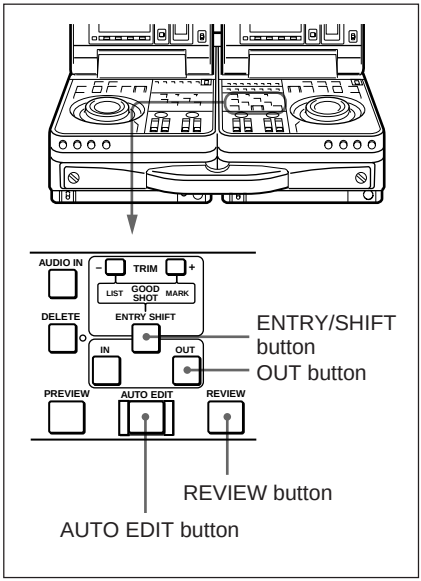


Note

To perform insert editing, CTL must be recorded in advance on the recorder side tape. You cannot perform editing on the sections of the tape where CTL have not been recorded. If a section with no CTL is encountered, the E-E picture for that section is replaced by noise on the monitor.

3-4-2 Starting an Edit

To start an edit, press the AUTO EDIT button.



The AUTO EDIT button is lit during an edit. It goes out when the edit finishes.

To stop an edit

Press the ENTRY/SHIFT button together with the OUT button.
The edit ends, and the point where you pressed the buttons becomes the OUT point.

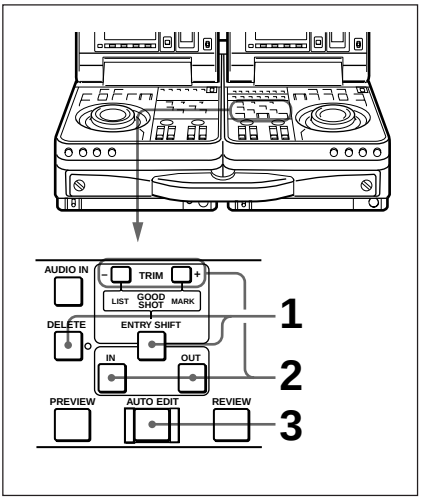
To abort an edit

Press the STOP button on the recorder.

To review the edit results
Press the REVIEW button. When the review ends, the tape returns to the OUT point and stops.

3-4-3 Redoing an Edit

Edit point data is retained even after you execute an edit, until you set new edit points.
You can redo an edit after modifying the edit point data.



1 Press the recorder DELETE button together with the ENTRY/SHIFT button.

2 Modify the edit points.

See "To Modify edit points slightly" (page 3-9) for the procedure.

3 Press the AUTO EDIT button.

The edit is executed.

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3-5 DMC Editing

Using the Betacam SX format on the player allows you to perform variable-speed editing by controlling the playback speed of the player from the recorder. This type of editing is called DMC (dynamic motion control) editing.

Playback speed can be controlled between ±1 times normal speed.

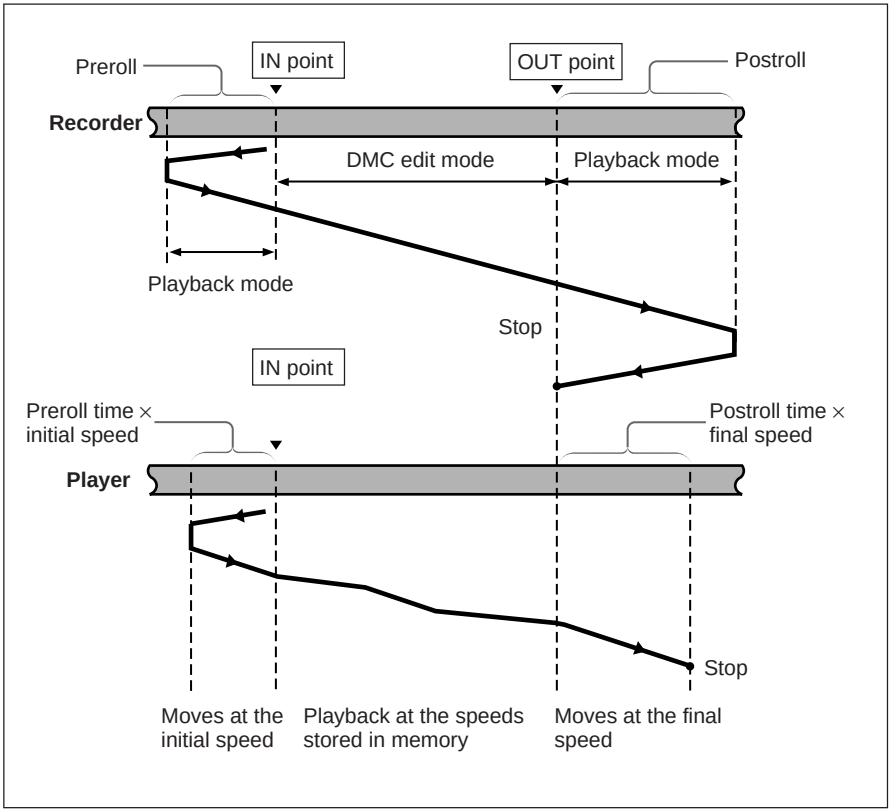
3-5-1 Overview of DMC Editing

Requirements for DMC editing

DMC editing is possible in either assemble or insert edit mode, but is not possible when executing audio split edit.

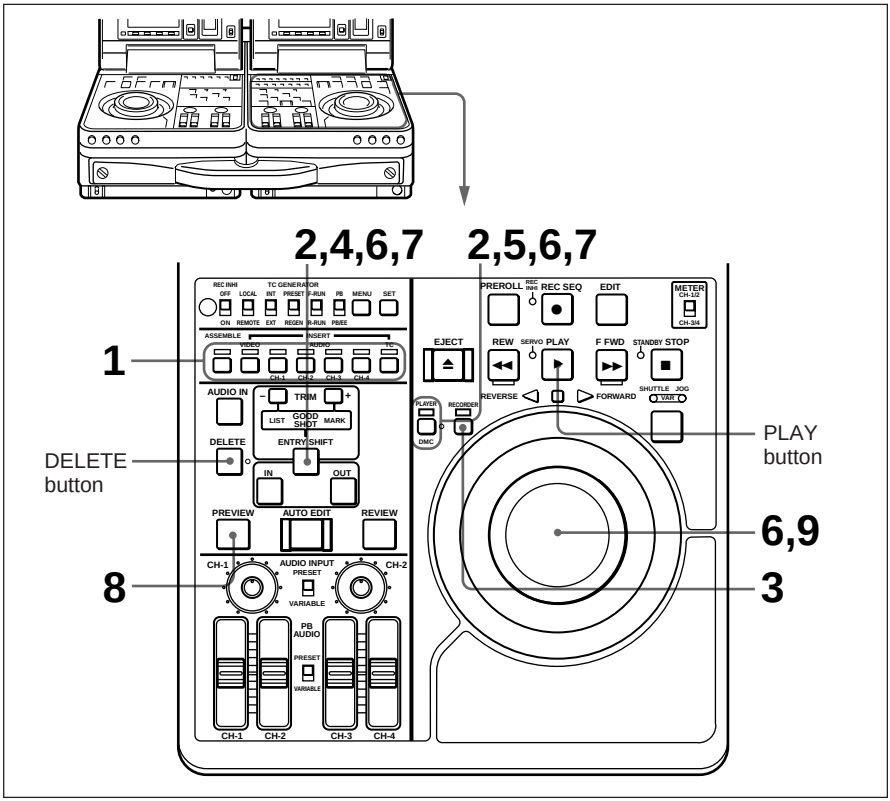
Tape movement during DMC editing

During DMC editing, the tape moves as shown in the diagram below.



3-5-2 Setting Edit Points and Playback Speeds

Perform the following procedure.



1 Press the ASSEMBLE or INSERT button to select edit mode.

2 Press the PLAYER/DMC button together with the ENTRY/SHIFT button.
The PLAYER/DMC indicator flashes and the unit enters DMC edit mode.
When the playback speed is stored in memory, the indicator flashes one time per second. When not, it flashes four times per second.

To exit DMC edit mode
Press the PLAYER/DMC button together with the DELETE button.

3 Press the RECORDER button.

4 To set edit points, press the ENTRY/SHIFT button together with the IN or OUT button.

5 Press the PLAYER/DMC button and set the IN point for the player.

Note

You cannot set an OUT point for the player.

6 Set the initial playback speed by rotating the shuttle dial while holding down the PLAYER/DMC button together with the ENTRY/SHIFT button.
If you wish to set the initial speed to normal speed, press the PLAY button.

The set speed is shown in sub LCD.

7 Once the initial speed has been set, release the PLAYER/DMC button and ENTRY/SHIFT button.

8 Press the PREVIEW button.

The tape is prerolled. The recorder tape runs at normal speed and the player tape runs at its initial speed.

9 When the search button starts to flash, indicating that the tape has reached the IN point, rotate the Jog/shuttle dial to the position corresponding to the desired playback speed.

The variations in playback speed are stored into memory while the search button is flashing.
When the tape passes the OUT point, the Jog/shuttle goes out.

If the JOG/SHUTTLE indicator goes out before the tape passes the OUT point

The unit cannot store any more variations in playback speed. The capacity of the playback speed memory is 120 seconds.

3-5-3 Executing DMC editing

Press the AUTO EDIT button.
DMC edit is executed at the playback speed(s) stored in memory.
Once the DMC edit has been completed, the playback speed(s) in memory are cleared.

To confirm the results of the edit

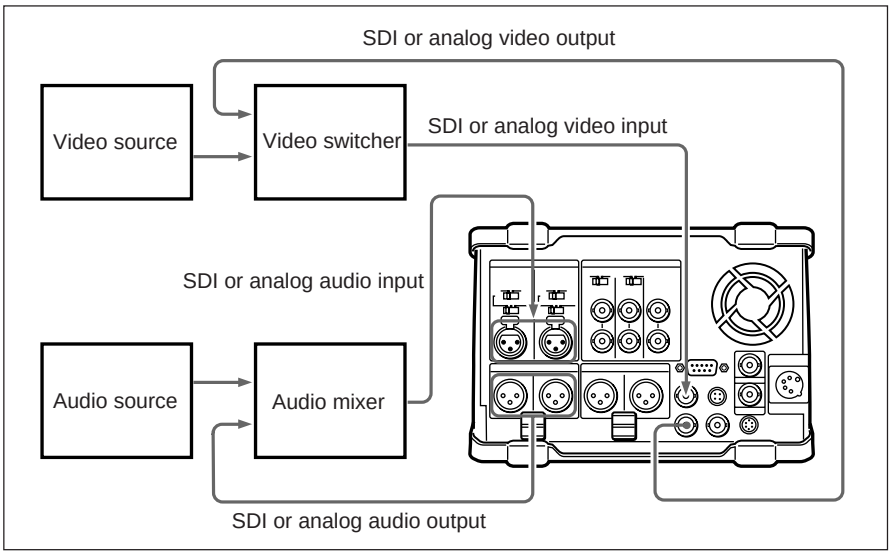
Press the REVIEW button.

3-6 Preread Editing

Video and audio signals (channels 1 to 4), already recorded onto the tape, can be used as an edit source for insert editing. This type of editing is called “preread editing”, as this unit uses the preread heads to read the signals in advance.

Signals read in advance can be sent to mixers for mixing and can be returned to the original channels or other audio channels (1 to 4).

For preread editing, set the “PREREAD” item on Video Setting Page 1/2 of the Sub LCD menu to “ON”.



Notes

- In preread editing, if an input video signal is used as the reference signal for the output video signal, oscillation may occur because of loop-closing. To avoid this, set the “OUT REF” item on Video Setting Page 1/2 of the Sub LCD menu to “REF” and set the item 309 in the setup menu to “AUTO1” to select the external reference signal for preread editing.
- When preread mode is selected, this unit will not shift into E-E mode in any operation mode, to avoid oscillation caused by the loop connection. When preread mode is turned off, however, the E-E signal is output and oscillation may occur if connection between the input and output of the same channel is not removed after preread editing.
  To prevent the oscillation, select PB mode for the video and digital audio channels in all the modes before the preread editing, as follows:

1 Set the monitor output switch to "PB".

2 On Video Setting Page 1/2 of the Sub LCD menu, set "PREREAD" to "ON".

3 Make the necessary connections for the preread editing.

4 Execute the preread editing after selecting the desired insert editing.

For details of executing insert editing, see 3-1-2 "Insert Editing".

5 After preread editing, break the connections used for the preread editing.

6 On Video Setting Page 1/2 of the Sub LCD menu, set "PREREAD" to "OFF".

7 Make sure that no loop connection remains.

- When using an external switcher, set setup menu item 727 *(page 6-33)* to EXT.
- Some switchers cannot be used due to their delay time. For details, consult Sony service personnel.

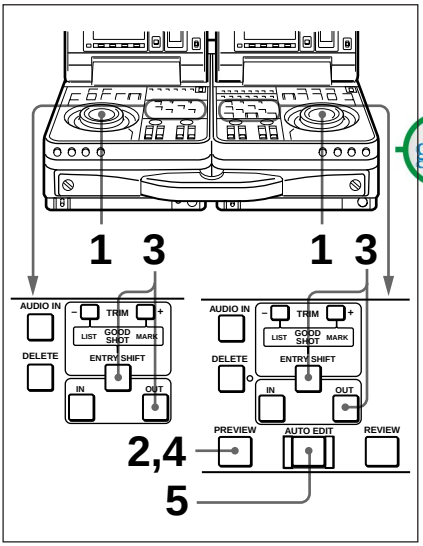
3-7 Special Editing

This section explains the following kinds of editing.
• Quick editing
• Continuous editing
• Manual editing

3-7-1 Quick Editing

After selecting the edit mode, you can work more efficiently by using quick editing, which allows you to set edit points and preview at the same time.

Proceed as follows.



1 Stop the tapes at the points where you want to set the recorder and player IN points.

2 Press the recorder PREVIEW button.

A preview starts. The points selected in step **1** are set as the IN points, and the IN buttons of the recorder and player light.

3 At the point where you want to set the OUT point, press the recorder or player OUT button together with the ENTRY/SHIFT button.

The OUT point is set, and the OUT button that you pressed lights.

4 Conduct another preview and modify the edit points as required.

5 Press the AUTO EDIT button.

The edit starts.
When the edit finishes, the recorder stops at the OUT point and player stops 2 seconds after the OUT point.

To edit even more quickly

1 Stop the tapes at the points where you want to set the recorder and player IN points.

2 Press the AUTO EDIT button.

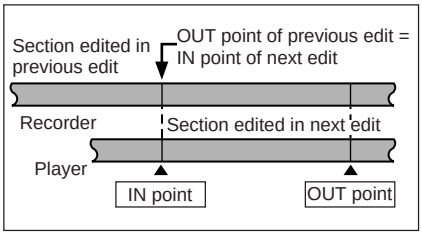
The edit starts.

3 While monitoring the picture, when you reach the point you want to set as the OUT point, press the player or recorder OUT button together with the ENTRY/SHIFT button.

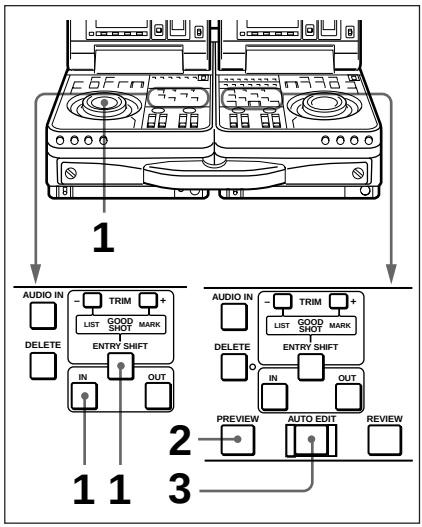
The point where the edit started is set as the IN point, and the point where the pressed the OUT and ENTRY/SHIFT buttons is set as the OUT point.

3-7-2 Continuous Editing

When you execute multiple edits in succession, you can edit from the second time on by setting the IN and OUT points of the player side only. After execution of an edit, the recorder returns automatically to the OUT point. Therefore, the recorder side OUT point of the current edit becomes the IN point of the next edit.



Use the following procedure.



1 Set the player IN point.

2 Press the recorder PREVIEW button to conduct a preview.

3 Press the AUTO EDIT button.

The edit starts.
When the edit ends, the recorder stops at the OUT point and player stops 2 seconds after the OUT point.

To stop an edit

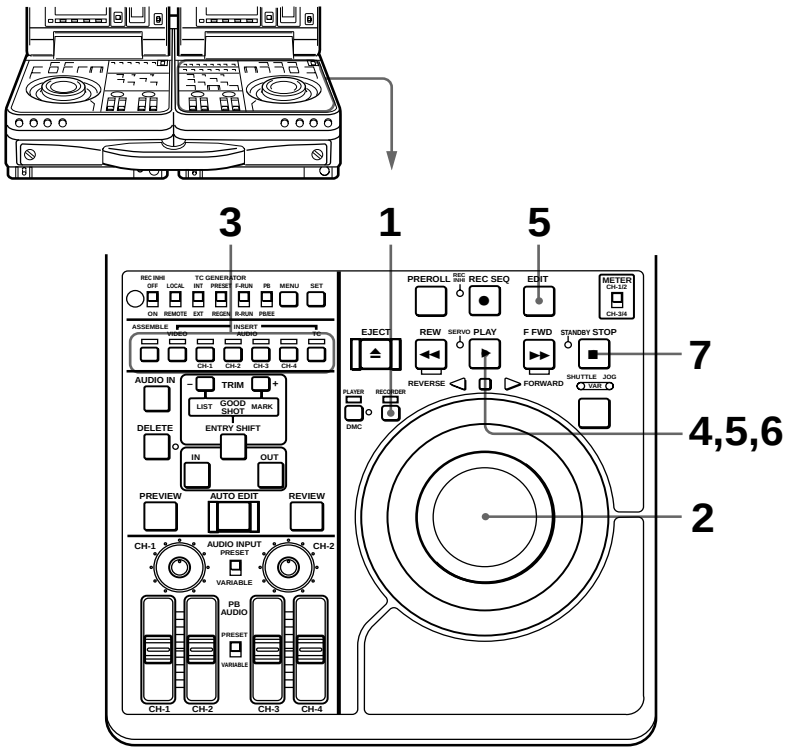
Press the ENTRY/SHIFT button together with the OUT button.
The edit ends, and the point where you pressed the buttons becomes the OUT point.

To abort an edit

Press the STOP button on the recorder.

3-7-3 Manual Editing

Perform manual editing using the recorder.



1 Press the RECORDER button, lighting the indicator.

2 Use the jog or shuttle dial to find the point where the edit will start (the recorder IN point), and stop the tape slightly in advance of this point.

Note

There will be some screen breakup at this point if the edit starts with the recorder in stop mode.

3 Select the edit mode.

4 Press the PLAY button.

Recorder playback starts.

Note

About 2 seconds are required for the picture to stabilize. You should begin playback at a point on the tape more than 2 seconds in advance of the section you will use in the edit.

5 Press the EDIT button together with the PLAY button at the point where you want to start the edit (the recorder IN point).

The edit starts.

6 Press the PLAY button at the point where you want to end the edit (the recorder OUT point).

The edit ends but player playback continues.

7 Press the STOP button to stop recorder playback.

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4-1 Recording

This section describes recording of external input signals. You can use both the recorder and player for recording.

4-1-1 Preparations for Recording

Perform the following procedure.

1 Connect the source signals.

2 Select video and audio signals which you want to record.
Video: SDI or composite signal *(see "⑩ Source video signal display" on page 2-21)*
Audio: SDI or analog audio signals for each channel *(see pages 2-24 and 2-25)*.

3 Make settings for reference video signals *(see page 2-11)*.

4 Make settings for timecode *(see page 2-13)*.

When using Betacam SP cassettes (player only)

Set the SP TAPE switch to SX.

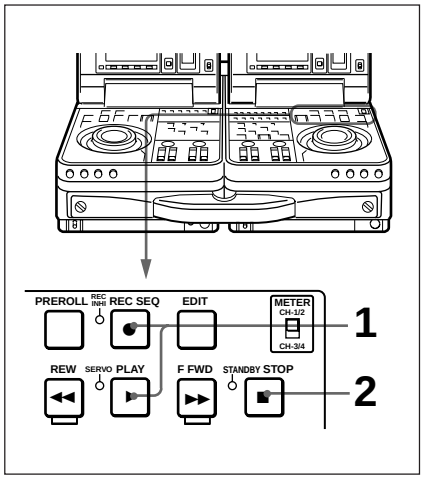
To adjust analog audio input level

For recording analog audio signals, you can adjust input level.

Set the AUDIO INPUT PRESET/VARIABLE switch on the control panel to VARIABLE. Turn the AUDIO INPUT CH-1/CH-2 knobs, monitoring the input levels indicated by audio level meter.

4-1-2 Recording Operation

Confirm that the cassette type display on the sub LCD is "SX" and that the REC INHI indicator on the control panel is not lit.
Then, follow the procedure below.



1 Press the REC/SEQ and PLAY buttons at the same time.

Recording starts and the POWER indicator turns to red.

2 Press the STOP button to stop recording.

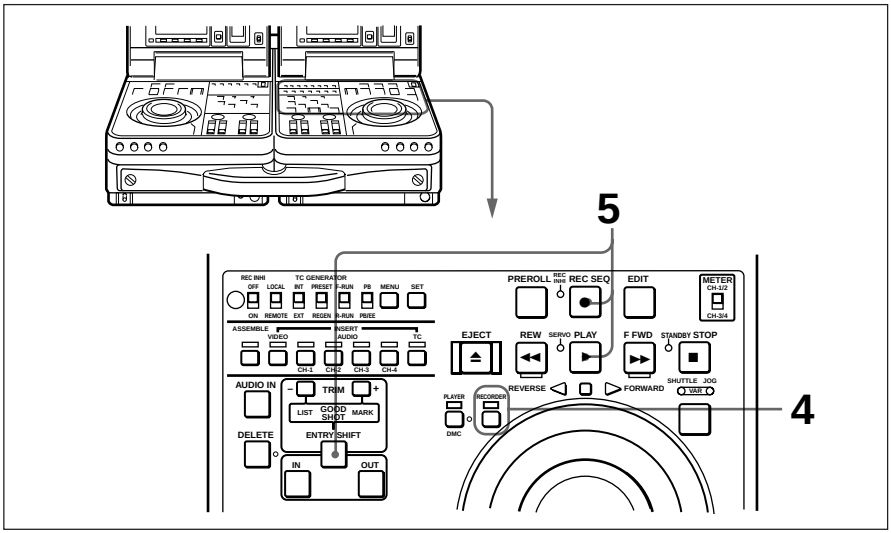
If recording continues to the end of the tape, the tape automatically rewinds to the beginning and stops.

4-2 Sequential Recording

This unit allows you to perform sequential recording with the recorder and player.
When you perform overwrite recording using only two cassettes, the last two hours recording can be obtained at any time.

When you renew the cassette about every 1 hour, endless recording is possible.

Use the following procedure. You can do control panel operations on the recorder and player during sequential recording.



Rewind the tape to the top beforehand.

1 Insert the cassettes into the recorder and player.

2 Connect the recorder and player, as for editing *(see page 2-6)*.

3 Set setup menu item 014 to a setting other than OFF *(see page 6-5)*.

4 Press the RECORDER button to light the RECORDER indicator.

5 Simultaneously press the ENTRY/SHIFT button, REC button, and PLAY button.

The recorder side begins recording.
The STANDBY indicator of the player goes out. The POWER indicator turns to orange.

The player starts recording automatically when the remaining time of the recorder side tape reaches 2 minutes.

The setting of Setup menu item 014 affects what happens when a tape ends.

When AUTOMATIC OVERWRITE is selected
Endless recording on the same cassette continues, overwriting on the previous contents.

When MANUAL CASSETTE REPLACE is selected
When the tape end is reached, the tape is rewound and the EJECT button begins to flash.
To continue recording, insert a new cassette into the recorder.
The recorder will starts recording automatically when the remaining time of the player side tape reaches 2 minutes.

To stop sequential recording

Sequential recording stops in the following cases.

- When a tape transport button (PLAY, STOP, F FWD, REW) or a search button is pressed during recording.
- If the cassette is not exchanged when the EJECT button flashes though setup menu item 014 is set to MANUAL CASSETTE REPLACE.

4-3 Playback

This section describes playback of tapes.

For playback using the jog/shuttle dials, see 3-2 "Finding Edit Points –Search".

4-3-1 Preparations for Playback

Perform the following procedure.

1 Connect video/audio signal output connectors to external equipment if necessary.

2 Select output audio signals *(see page 2-26)*.

3 Press the CTL/TC/U-BIT button to select the time data.

When using CTL
Press the RESET button to set the value to "0:00:00:00".

When using timecode or user bits
Select the type of timecode (VITC/LTC/AUTO) using the sub LCD menu *(see page 2-21)*.

4 Set the METER switch to CH-1/2 or CH-3/4 to select the channels indicated by audio level meter.

5 Select the playback format on the player.

To play back cassettes recorded in Betacam SP format
Set the
SP TAPE switch to SP PB ONLY.

To play back Betacam SP cassettes recorded in Betacam SX format
Set the SP TAPE switch to SX.

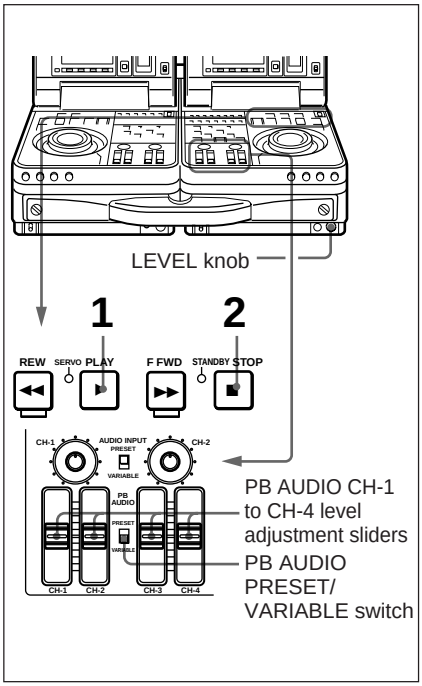
To output the timecode synchronized with the output video signal

The playback timecode or the timecode read by the timecode reader can be output from the TC OUT connector.

Select REGEN in setup menu item 606 *(see page 6-22)*, set the INT/EXT switch on the control panel to INT, and the PRESET/REGEN switch to REGEN.

4-3-2 Playback Operation

Confirm the recording format of the cassette (SX, SP or OX) indicated on the sub LCD of the player (or SX is indicated on the Sub LCD of the recorder).
Then, perform the following procedure.



1 Press the PLAY button.

Playback starts.

To adjust speaker/headphones audio level
Rotate the LEVEL knob on the front control section.

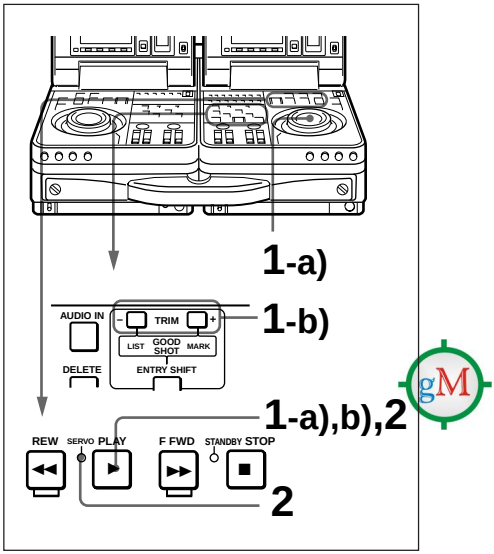
To adjust audio playback level
Set the PB AUDIO PRESET/ VARIABLE switch to VARIABLE, and adjust using the PB AUDIO CH-1 to CH-4 level adjustment sliders.

2 Press the STOP button to stop playback.

If playback continues to the end of the tape, the tape automatically rewinds to the beginning and stops.

4-3-3 Capstan Override Playback

When playing back the same program on two VTRs, the capstan override function is convenient for frame synchronization of playback pictures.



1 Adjust the playback speed using either method a) or b).

a) Holding down the PLAY button, rotate the shuttle dial. The adjustment range is ±15% in steps of 1%.

b) Holding down the PLAY button, press one of the TRIM buttons (+/MARK or –/LIST). The adjustment range is ±8%.

2 Release the PLAY button when the adjustment is completed.

The VTR returns to normal speed playback and the SERVO indicator lights.

5-1 Overview of Shot Mark/Shot Data Function

This unit can record shot marks or use shot marks recorded with Betacam SX camcorders (shot marker function). The shot mark function enables quick access to the marked points, for efficient editing.
When shot data is recorded on the tape, you can display the data and make use of it for sorting shot marks.

5-1-1 Shot Mark Function Features

The shot mark function has the following features.

(1) Listing shot mark types and timecodes

There are four types of shot marks: REC Start (R), Shot Mark 1 (S1), Shot Mark 2 (S2) and Post Mark (mark added with this unit).
The unit memorizes the mark type and the timecode (LTC) for the mark position for up to 200 marks read from a tape. Once the marks have been memorized, they remain in memory even when the unit is powered off.
You can display the list of shot marks on the LCD monitor. You can also use the Shot Mark Operation menu to create shot mark lists by reading in only the specified shot mark types, and delete all or a part of data in a list when it is no longer needed.

For more information about shot marks, refer to the Operation Manual of your Betacam SX camcorder.

(2) Writing and deleting shot marks

You can use the Shot Mark Operation menu to specify whether REC Start marks are recorded. You can write additional shot marks at any position on the tape and delete individual marks that are no longer needed.

(3) Creating virtual shot marks

You can add virtual shot marks to the shot mark list during playback or search. (They are not recorded on the tape.)

(4) Inserting memo marks

You can place a memo mark (#) on shot marks that you want to remember.

(5) Sorting shot marks

Each time that marks are read in, they are sorted and displayed in a list.
When shot data is recorded, you can sort the marks to display which cassette they were read from. You can also sort shot marks by timecode. If two marks with the identical timecode are read, one of the marks is deleted.

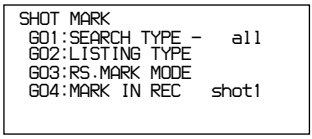
(6) Cueing up shot marks

You can cue up a shot mark by selecting it from the shot mark list. You can also cue up a shot mark located close to the current position (index function).

5-1-2 Shot Mark Operation Menu

To display the Shot Mark Operation menu, press the MENU button while pressing the TRIM+/MARK button.

The menu shown in the figure appears.



The Shot Mark Operation menu is composed of four items, G01 to G04. The settings for each item are shown below.

Number	Name	Settings
G01	SEARCH TYPE SELECT	Select the type of shot marks to index. rec start mark shot mark 1 shot mark 2 post mark [all]
G02	LISTING TYPE SELECT	Select whether to include marks types in the mark list. rec start mark: Include REC Start marks([ON]/OFF) shot mark 1: Include Shot Mark 1 ([ON]/OFF) shot mark 2: Include Shot Mark 2 ([ON]/OFF) post mark: Include Post Mark ([ON]/OFF).
G03	REC START MARK MODE	Select whether to record REC Start marks, for each operating mode. crash REC: Write REC Start marks in crash REC mode ([ON]/OFF) assemble: Write REC Start marks in assemble mode ([ON]/OFF) insert: Write REC Start marks in insert mode (ON/ [OFF])
G04	MARK SELECT IN REC/ASSEMBLE	Select the type of marks written during recording and in assemble mode. [shot mark 1] shot mark 2 post mark

To change the settings

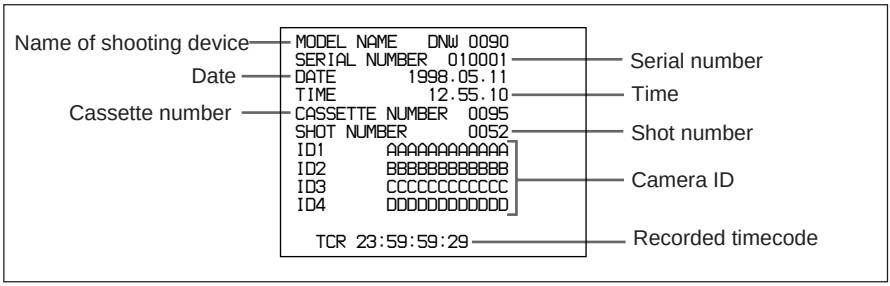
The procedures for selecting and changing menu items are the same as the procedures for the Setup menu. To change items G02 and G03, press the STOP button and select the item whose ON/OFF setting you want to change. Then rotate the jog or shuttle dial while pressing the Search button to change the ON/OFF setting.

For more information about using the Setup menu, see section 6-2-2 "Basic Menu Operations".

5-1-3 Reading Shot Data

Shot data is recorded continuously on the tape during shooting.
To display shot data, press the PLAY button together with the ENTRY/SHIFT button.

The tape is played back, and the display shown below appears.



The contents of the display change as the shooting conditions change (for example, the date and time or shooting device change). Sections where no data is recorded because you changed the shooting device are blank.

To turn off the display

Press the ENTRY/SHIFT button again together with the PLAY.

5-2 Shot Mark Operations

Use local mode for shot mark operations. (Remote control shot mark operations are not possible.)

5-2-1 Reading Shot Marks

To read shot marks, insert a cassette on which shot marks have been recorded into the recorder or player and press the TRIM–/LIST button while holding the F FWD or REW button.
The FWD or REW button flashes while the shot marks are being read. The search stops when it reaches the tape end.

Note

The maximum number of shot marks that can be read is 200. Reading stops when 200 marks have been read. At the same time, the message “SHOT LIST FULL” appears in the sub LCD and the WARNING indicator flashes. The same message and warning are given if 200 marks have already been read in at the time when reading starts. To cancel the alarm, press one of the tape transport buttons.

To stop reading shot marks

Press the STOP button.

To read shot marks from multiple cassettes

You can read shot marks from multiple cassettes by exchanging the cassettes. The unit adds marks from the new cassettes to the end of the shot mark list, until the limit of 200 marks is reached. For example, if 190 marks have already been read, up to 10 marks can be read from the next cassette.
A dividing line (broken line) is displayed between the data of the first cassette and the data of the next cassette.

To read only selected mark types

If you need only a specific mark type, use item G02 on the Shot Mark Operation menu to select that type.

5-2-2 Writing Shot Marks

To write REC Start marks

You can write REC Start marks during crash REC, assemble, and insert mode. Under item G03 of the Shot Mark Operation menu, change the setting of the mode you want to use to ON.

Note

For insert mode, press the TC button to turn the indicator on.

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To write shot marks

To write shot marks in recording and assemble mode

Under Shot Mark Operation menu item G04, select the type of mark you want to write. To write a mark, press the TRIM+/MARK button while holding the ENTRY/SHIFT button at the point where you want to write the mark. The message “RECORD SHOT MARK” appears on the LCD monitor and in the lower part of the sub LCD while the mark is being written.

To write marks in playback, stop, and search modes

You can only write Post Marks in these modes.
To write a mark, press the TRIM+/MARK button and keep it pressed for 2 seconds or longer. This puts the unit into shot mark write and delete mode (the ENTRY/SHIFT button flashes). At the position where you want to write the mark, press the TRIM+/MARK button while holding the ENTRY/SHIFT button. The message “RECORD SHOT MARK” appears on the LCD monitor and in the lower part of the sub LCD, and the REC button lights while the mark is being written.

Note

LTC user bits are used to record shot marks.
If LTC user bits are used for recording other data, this data may be affected by the shot marks.

5-2-3 Creating a Virtual Shot Mark

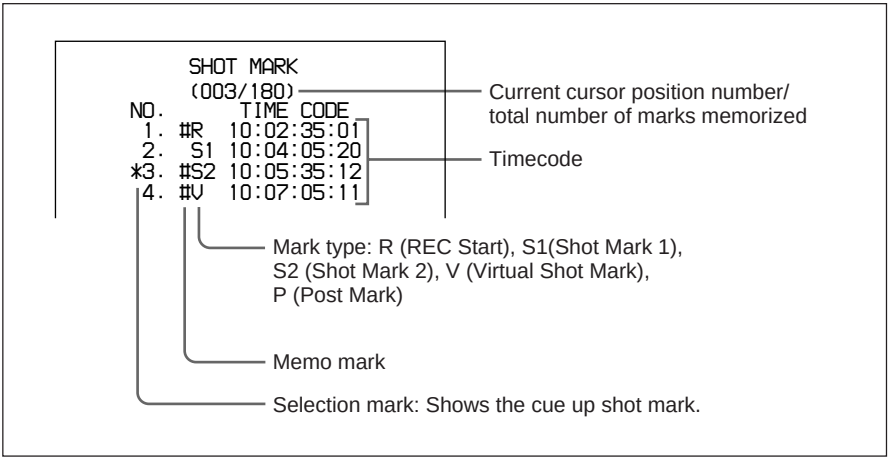
During playback or search, press and hold the ENTRY/SHIFT button, and press the TRIM+/MARK button while holding the ENTRY/SHIFT button.

A virtual shot mark is entered, and the message “V-MARK xxx” appears on the LCD monitor and in the lower part of the sub LCD (xxx is the mark number).

5-2-4 Displaying Shot Mark List

To display the shot mark list, press and hold the ENTRY/SHIFT button, and press the TRIM–/LIST button while holding the ENTRY/SHIFT button.
Press the buttons again to cancel the display.

The figure on next page shows the contents of the shot marker list.



To select a mark

Rotate the jog or shuttle dial to move the selection mark (∗) to the left of the number of the mark you want to select.

To attach a memo mark (#)

Select the mark to which you want to attach the memo mark, then press the SET button.

Detaching the memo mark

Select the mark from which you want to detach the memo mark, then press the SET button.

To make the shot mark list of selected shot marks

1 Display the shot mark list and press and hold the STOP button, and press the SET button while holding the STOP button.

The mark selection display appears.

2 Rotate the jog or shuttle dial to select a mark.

3 Rotate the jog dial while holding down the search button to select ON or OFF for the selected mark. Select ON to list it and select OFF to skip it.

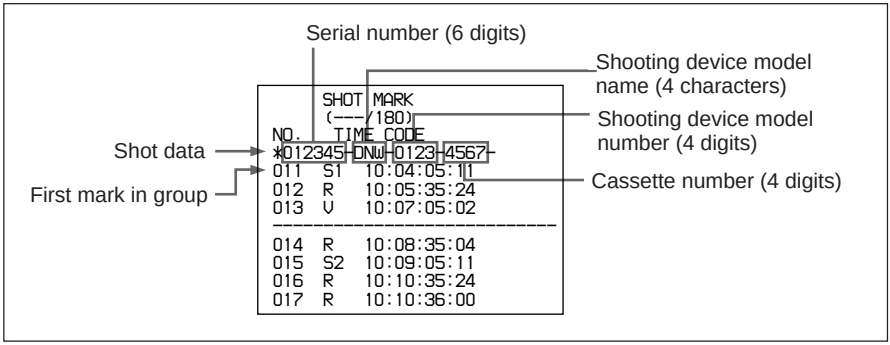
Returning to the shot mark list display

Press the STOP button together with the SET button.

To display shot marks and shot data at the same time

At one of the broken lines in the shot mark list, rotate the jog or shuttle dial to move the selector mark (∗).
If shot data was recorded for the first mark in the group below the broken line, the following data is displayed.

You can sort the marks in the list by the information in shot data. For details, see section 5-2-6 "Sorting Shot Marks".



To delete shot marks from the list

Proceed as follows to select and delete shot marks that are no longer needed.

1 In the shot mark list, select the mark to delete.

2 Press the TRIM+/MARK button.

While you press the button, an "X" is displayed in the list after the number of the selected mark. The "X" mark indicates deletion, and disappears when you release the button.

If you only want to delete one mark, proceed to step **4**.

3 While keeping the button pressed, rotate the jog or shuttle dial to select a range of marks to delete.

4 While keeping the button pressed, press the DELETE button.

The marks with "X" marks are deleted.

Deleting all data in a list

Press and hold the DELETE button, and press the TRIM–/LIST button while holding the DELETE button.

5-2-5 Deleting Shot Marks

You can select shot marks from the list and delete them from the tape. To delete shot marks, press the TRIM+/MARK button and keep it pressed 2 seconds or longer to put the unit into shot mark write and delete mode (the ENTRY/SHIFT button flashes). Display the shot mark list and select the marks you want to delete, then press the TRIM+/MARK button while holding the DELETE button. While the mark is being deleted, the message "ERASE SHOT MARK" appears on the LCD monitor and in the lower part of the sub LCD, and the REC button lights.

Notes

- This operation deletes the shot marks that were recorded on the tape. Once they are deleted, shot marks cannot be recovered.
- If you change cassettes or turn off the unit after reading shot marks, you cannot delete the shot marks.

5-2-6 Sorting Shot Marks

Proceed as follows to classify shot marks by cassette and sort them in timecode order.

1 With the shot mark list displayed, press the STOP button together with the SET button.

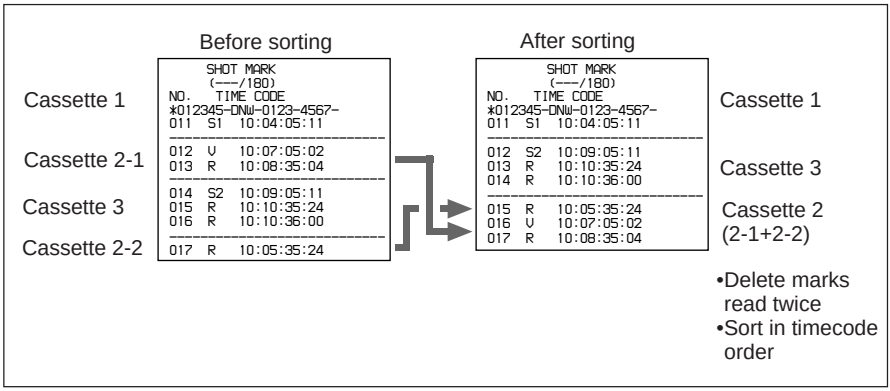
The mark selection screen appears.

2 Rotate the jog or shuttle dial to select “SORTING LIST”.

3 While pressing the Search button, rotate the jog or shuttle dial to change the setting to ON.

Sorting of the list starts.
When sorting finishes, the setting returns to OFF.

The following example shows the results of sorting, using a list that contains marks that you have read twice from the same cassette.



5-2-7 Cueing up a Mark

Select the mark displayed in the list and press the PREROLL button.

To cue up a mark located close to the current tape position

Press the TRIM+/MARK button together with the F FWD or REW button. The F FWD or REW button flashes during the operation.

Note

It is impossible to cue up a virtual shot mark.

gM

6-1 Menu System Configuration

The menu system of this unit comprises the basic menu and extended menu.

• Basic menu
This menu is used to make settings relating, for example, to the following.
– the hours meter
– the preroll time
– the character information superimposed on the output to the monitor
– switching between the 525/60 (NTSC) system and 625/50 (PAL) system
– the menu banks for retaining menu settings

For detailed information about menu operation relating to the hours meter, see "Digital Hours Meter" (page A-3).

• Extended menu
This menu is used to make a wide range of settings relating to the functions of this unit, for example, the control panel functions, video and audio control, and digital data processing.

6-2 Basic Menu

6-2-1 Items in the Basic Menu

The basic menu contains the following items *(see next page)*.

In the "Settings" column of the table, the factory default settings are indicated by an enclosing box.

Item number	Item name	Settings
001	PREROLL TIME	0S...[5S]...30S: Set the preroll time to between 0 and 30 seconds in steps of 1 second. A preroll time of at least 5 seconds is recommended when using this unit for editing.
002 a)	CHARACTER H-POSITION	Adjust the horizontal screen position of the character information (as a hexadecimal value) which is superimposed on output from the VIDEO OUTPUT 2(SUPER) connector and display on the LCD monitor. 00...[14]...24 (525 mode, 37 steps)/00...[12]...22 (625 mode, 35 steps): The hexadecimal value 00 is for the far left of the screen. Increasing the value moves the position of the characters to the right.
003 a),b)	CHARACTER V-POSITION	Adjust the vertical screen position of the first line of the character information (as a hexadecimal value) which is superimposed on output from the VIDEO OUTPUT 2(SUPER) connector and display on the LCD monitor. 00...[56]...6A (525 mode, 107 steps)/00...[6A]...81 (625 mode, 130 steps): The hexadecimal value 00 is for the top of the screen. Increasing the value lowers the position of the characters.
004	SYNCHRONIZE	When editing using this unit as a controller and an external VTR connected to this unit via a 9-pin remote control cable, this item determines whether or not to operate the two units in phase synchronization. [ON]: Operate in phase synchronization. OFF: Do not operate in phase synchronization.

a) When setting items 002, 003, 009, and 011, watch the monitor screen, and adjust to the required state.

b) When displaying time code values, there is a slight time delay. Therefore, when creating a tape for off-line editing, the information inserted in the upper half of the screen may be delayed by one frame.

Item number	Item name	Settings
005	DISPLAY INFORMATION SELECT	Determines the kind of character information which is superimposed on output from the VIDEO OUTPUT 2(SUPER) connector and display on the LCD monitor when the SUPER in the sub LCD menu is set to ALL/CPSTALL. [T&STA]: Time data display information and the unit's status. T&UB: Time data display information and the user bits. T&CTL: Time data display information and CTL. T&T: Time data display information and time code (LTC or VITC) only. If there is an overlap between the setting of this item and the setting of the control panel, it is automatically avoided. For example, if CTL is selected on the control panel and this menu item setting is T&CTL, then CTL and LTC are output.
006	LOCAL FUNCTION ENABLE	Determines which tape transport control buttons on the control panel are enabled when this unit is controlled from external equipment. DIS: All buttons and switches are disabled. [ST&EJ]: Only the STOP button and EJECT button are enabled. ENA: All buttons and switches except the RECORDER button and PLAYER/DMC button are enabled.
007	TAPE TIMER DISPLAY	Determines whether to display the CTL count in 12-hour mode or 24-hour mode. [+ –12H]: 12-hour mode 24H: 24-hour mode
008	MONITORING SELECTION FOR VTR-TO-VTR EDIT	For recorder-player editing, determines whether the recorder is forced into E-E mode when the recorder's PLAYER/DMC button is pressed to view the player's playback signals on the LCD monitor on the recorder. [MANU]: Do not force the recorder into E-E mode. AUTO: Force the recorder into E-E mode.

Item number	Item name	Settings
009 a)	CHARACTER TYPE	Determines the type of character information (timecode, etc) which is superimposed on output from the VIDEO OUTPUT 2(SUPER) connector and display on the LCD monitor. [WHITE]: White letters on a black background. BLACK: Black letters on a white background. W/OUT: White outline letters. B/OUT: Black outline letters.
011 a)	CHARACTER V-SIZE	Determines the vertical size of character information (timecode, etc) which is superimposed on output from the VIDEO OUTPUT 2(SUPER) connector and display on the LCD monitor. [× 1]: Standard size × 2: 2 times standard size × 3: 3 times standard size × 4: 4 times standard size
013	525/625 SYSTEM SELECT	Specify whether to enable switching between the 525 (NTSC) and 625 (PAL) systems. [OFF]: Do not enable system switching. ON: Enable system switching. Setting this item to ON and switching the system enables the unit to operate in the system switched to. **Notes** • All items in the setup menu are set to the current values for the system switched to (different from the values for the original system). • For Betacam/Betacam SP cassettes, only simple viewing is possible. For details about switching procedure, see “Switching between 525/625 line systems (menu item 013)” on page 6-8.

a) When setting items 002, 003, 009, and 011, watch the monitor screen, and adjust to the required state.

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Item number	Item name	Settings
014	SEQUENTIAL RECORD MODE	Select the mode for sequential recording by the recorder and player. OFF: No sequential recording. MANUAL CASSETTE REPLACE: Do sequential recording one time. Exchange the cassettes when one sequential recording finishes. AUTOMATIC OVERWRITE: Do sequential recording, overlaying previously recorded contents. (Do not exchange cassettes.)

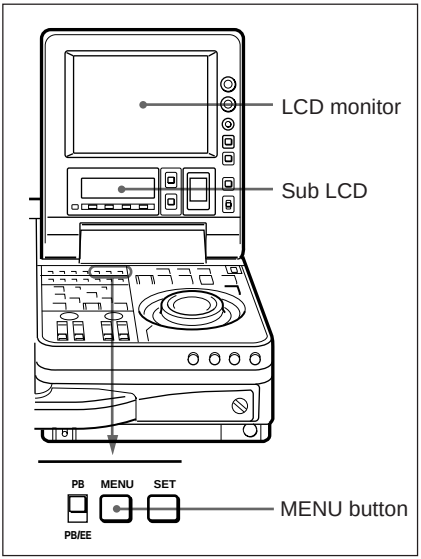
Item number	Item name	Settings
B01	RECALL BANK 1	Set to ON to recall menu settings from menu bank 1.
B02	RECALL BANK 2	Set to ON to recall menu settings from menu bank 2.
B03	RECALL BANK 3	Set to ON to recall menu settings from menu bank 3.
B04	RECALL BANK 4	Set to ON to recall menu settings from menu bank 4.
B11	SAVE BANK 1	Set to ON to save current menu settings to menu bank 1.
B12	SAVE BANK 2	Set to ON to save current menu settings to menu bank 2.
B13	SAVE BANK 3	Set to ON to save current menu settings to menu bank 3.
B14	SAVE BANK 4	Set to ON to save current menu settings to menu bank 4.
B20	RESET SETUP	Set to ON to reset current active settings to factory default values.

6-2-2 Basic Menu Operations

This section describes the basic menu displays and how to change the settings.

For information about how to use item 013, see the section "Switching between 525/625 line systems (menu item 013)"(page 6-8), and for information about how to use items B01 to B14, see the section "Menu bank operations (menu items B01 to B14"(page 6-9).

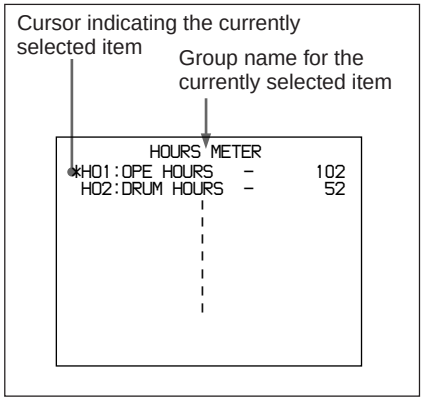
Displaying the menus



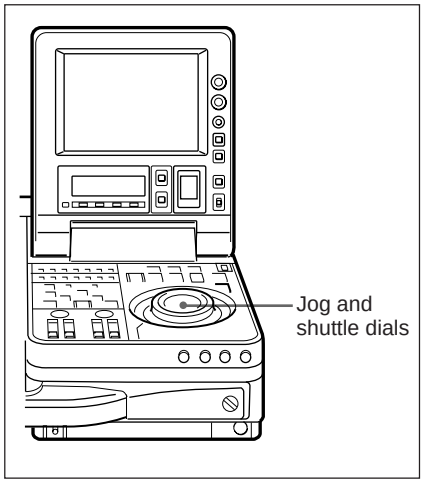
Press the MENU button.
The setting of the currently selected menu item appears in the LCD monitor and sub LCD.

Output from the VIDEO OUTPUT 2(SUPER) connector

When the SUPER in the sub LCD menu is set to ON *(see page 2-31)*, the same menu screen also appears on a monitor connected to the VIDEO OUTPUT 2(SUPER) connector as shown in the LCD monitor.



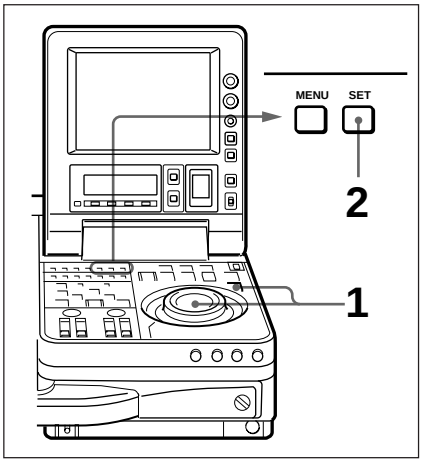
Changing the currently displayed menu item



Turn the jog or shuttle dial depending on the current search mode (indicated by JOG/SHUTTLE indicators).
Turning the jog or shuttle dial in the clockwise direction increments the item number, and turning it in the counterclockwise direction decrements the item number.
If you turn the shuttle dial, the item number changes at a rate depending on the shuttle dial angle. If you turn the jog dial, the item number changes on the jog dial rotation speed.

Changing a menu item setting value

To change the setting value of the currently displayed menu item use the following procedure.



1 Holding down the search button, turn the jog or shuttle dial.

The setting value changes at a rate depending on the shuttle dial angle or on the jog dial rotation speed.

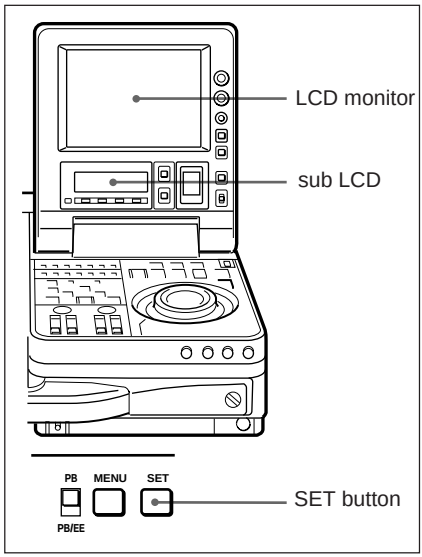
2 When the desired setting value is displayed, press the SET button.

This saves the new setting value, and the menu display disappears.

To abandon making a change

Press the MENU button before pressing the SET button.
The menu display disappears from the LCD monitor and sub LCD, without the new setting value being saved.

Resetting the menu settings to their factory default values (menu item B20)



1 Set menu item B20 RESET SETUP to ON.

"PUSH SET BTN" appears in the sub LCD, and "Push SET button" appears on the LCD monitor.

(Continued)

2 Press the SET button.

The current active menu settings are reset to their factory default settings.

3 Press the SET button again.

The settings are saved and the menu display disappears.

Switching between 525/625 line systems (menu item 013)

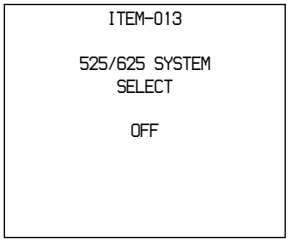
Using the following procedure, you can set basic menu item 013, 525/625 SYSTEM SELECT, to “ON”, and then switch between 525 (NTSC) and 625 (PAL).
(The following procedure shows by way of example how to switch from a 525 (NTSC) system to a 625 (PAL) system.)

Note

After switching, playback of Betacam/ Betacam SP cassettes is also performed in the selected mode. However in 625 mode, only simple viewing is allowed and the capstan lock mode is fixed to 2FD.

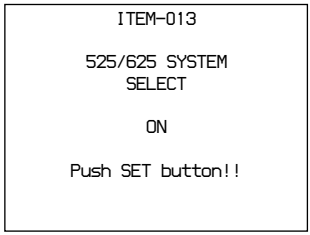
1 Select menu item 013.

The LCD monitor shows the following display.



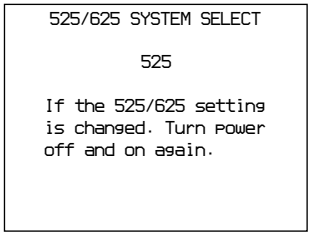
2 Holding down the search button, turn the jog or shuttle dial to change the setting from “OFF” to “ON”.

The display changes as follows.



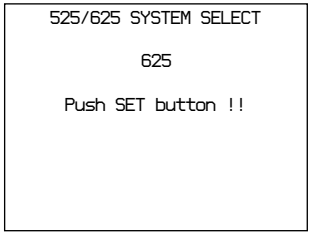
3 Press the SET button.

The display changes as follows.



4 Holding down the search button, turn the jog or shuttle dial to change the setting from “525” to “625”.

The displays change as follows.



To abandon the 525/625 setting operation

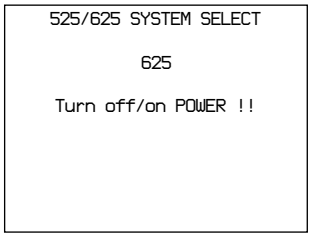
Press the MENU button a required number of times to exit from the menu.

Note

Once you execute step **5**, it is not possible to abort the operation.

5 Press the SET button.

The displays change as follows.



6 Turn the POWER switch off momentarily, then on again.

This switches from a 525(NTSC) to 625(PAL) system; the 525 indicator goes out, and the 625 indicator lights in the sub LCD.

Menu bank operations (menu items B01 to B14)

This unit allows four different complete sets of menu settings to be saved in both 525 and 625 modes in what are termed “menu banks” numbered 1 to 4. Saved sets of menu settings can be recalled for use as required.

To access to menu item B01 quickly

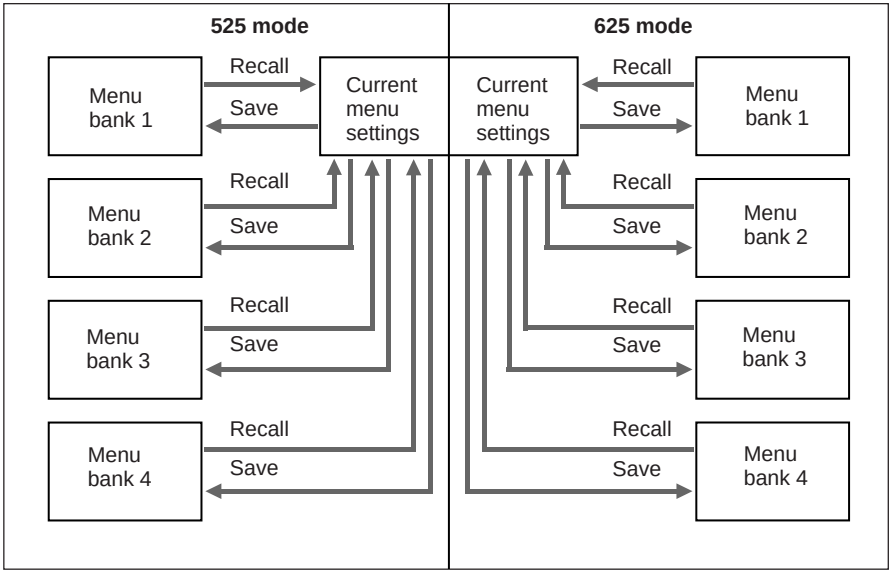
You can recall any required menu item by turning the jog or shuttle dial after pressing the MENU button.
If you press the MENU button first, then the CTL/TC/U-BIT button, you can jump directly to menu item B01 or H01. The recalled menu item toggles between B01 and H01 every time you press the CTL/TC/U-BIT button.

Saving the current active menu settings

Set one of menu items B11 SAVE BANK 1 to B14 SAVE BANK 4 to ON, depending on which of the menu banks you wish to save in, then press the SET button.

Recalling settings from a menu bank

Set one of menu items B01 RECALL BANK 1 to B04 RECALL BANK 4 to ON, depending on which of the menu banks you wish to recall from, then press the SET button.


525 mode
625 mode
Menu bank 1
Recall
Save
Current menu settings
Current menu settings
Recall
Save
Menu bank 1
Menu bank 2
Recall
Save
Recall
Save
Menu bank 2
Menu bank 3
Recall
Save
Recall
Save
Menu bank 3
Menu bank 4
Recall
Save
Recall
Save
Menu bank 4

6-3 Extended Menu

6-3-1 Items in the Extended Menu

The extended menu contains the following items.

In the “Settings” column of the table, the factory default settings are indicated by an enclosing box.

Menu items in the 100s, relating to the control panels

Item number	Item name	Settings
101	SELECTION FOR SEARCH DIAL ENABLE	Select how the unit enters the search mode. [DIAL]: Turning the jog or shuttle dial switches to search mode at all times except during recording/editing. KEY: The search button must be pressed to switch to search mode.
104	AUDIO MUTING TIME	Select the length of time for which audio muting occurs when the unit switches to playback either from stopped or from still playback in the search mode (for Betacam or Betacam SP playback only). [OFF]: Set the audio muting time to zero (i.e. no muting). 0.1S... 1.0S: Set the audio muting time from 0.1 seconds to 1.0 second, in 0.1-second increments.
105	REFERENCE SYSTEM ALARM	Select whether or not to display a warning when the video/audio reference signal selected by the OUT REF in the sub LCD menu, is not supplied or is out of phase with the input video signal. [OFF]: No warning. ON: Flash the STOP button as a warning.
106	CAPSTAN LOCK	Select the capstan servo lock mode. [SW]: The capstan servo lock mode is determined by the CAPSTAN in the sub LCD menu. 2F: The capstan servo locks every two fields regardless of the setting of the CAPSTAN in the sub LCD menu. 4F: The capstan servo locks every four fields regardless of the setting of the CAPSTAN in the sub LCD menu. 8F (For 625 mode only): The capstan servo locks every eight fields regardless of the setting of the CAPSTAN in the sub LCD menu

Menu items in the 100s, relating to the control panels (continued)

Item number	Item name		Settings
107	REC INHIBIT LAMP FLASHING		Select whether or not to flash the REC INHI indicator when recording is prevented though the REC INHI switch on the control panel is set to OFF. [OFF]: Light the REC INHI indicator. ON: Flash the REC INHI indicator.
108	AUTO EE SELECT		When a cassette recorded in Betacam SX format is inserted and the monitor output switch on the control panel is set to PB/EE, select the operation modes in which input video and audio signals are automatically handled in E-E mode. [S/F/R]: In STOP/EJECT/F FWD/REW modes STOP: In STOP/EJECT modes
109	FORCED EE WHEN TAPE UNTHREAD		During tape threading and unthreading, and when no cassette is inserted, select whether the monitor output switch on the control panel controls the output signal PB/EE setting. [ON] : No control by the monitor output switch (the signal is always an E-E signal). OFF: Control by the monitor output switch.
118	KEY INHIBIT SWITCH EFFECTIVE AREA		Select which switches and buttons can be operated when the KEY INH in the sub LCD menu is set to ON. The following sub-items control different sets of switches and buttons independently.
	Sub-item		
	118-1	REMOTE SELECT	Select whether the REMOTE/LOCAL switch on the control panel is enabled. [DIS] : Disabled. ENA: Enabled.
	118-2	CONTROL PANEL	Select which switches and buttons operations on the control panel are enabled. [DIS] : All switches and buttons are disabled. EDIT: All switches and buttons for editing operations are disabled. ENA: All switches and buttons are enabled. ST&EJ: All switches and buttons except STOP and EJECT buttons are disabled.

Menu items in the 100s, relating to the control panels (continued)

Item number	Item name	Settings
119	VARIABLE SPEED LIMIT IN KEY PANEL CONTROL	Select the playback speed range when carrying out playback in variable mode from the control panel of this unit. [OFF]: –1 to +1 times normal speed. ON: 0 to +1 times normal speed.
120	CTL LOCK IN VAR/ SHTL	Select whether the tape transport should be phase-locked to the CTL during playback in variable or shuttle mode. [OFF]: Not phase-locked. ON: Phase-locked at the following speeds: –1, –0.5, +0.5 and 1.0 times normal.
122	AUTO EE WITH ANALOG TAPE	Select whether or not the setting of item 108 also applies to a cassette recorded in Betacam/Betacam SP format. Item 108 selects the VTR modes in which input video and audio signals are automatically handled in E-E mode, when a cassette recorded in Betacam SX format is inserted and the monitor output switch on the control panel is set to PB/EE. [DIS] : When a cassette recorded in Betacam/ Betacam SP format is inserted, always use PB mode. ENA: When a cassette recorded in Betacam/ Betacam SP format is inserted, follow the setting of item 108.
127	CASSETTE SELECT WARNING	Select whether or not to flash the WARNING indicator during playback of a Betacam SP tape when the tape's recording mode does not agree with the playback mode set on the unit (recorder side: SX, player side: SP TAPE switch position) . [ON]: Flash. OFF: Do not flash.

Menu items in the 200s, relating to the remote control interface

Item number	Item name	Settings
201	PARA RUN	Select whether or not to use synchronized operation for two or more VTRs. [DIS]: No synchronized operation. ENA: Use synchronized operation. **Note** To use synchronized operation for two or more VTRs, set item 201 to "ENA" on all of the VTRs.
202	CF FLAG (only valid in 625 mode)	Select the mode for locking color framing sent to a remote controller. [8F]: Eight-field locking mode 4F/8F: Four- or eight-field locking mode

Menu items in the 300s, relating to editing operations

Item number	Item name	Settings
301	VAR SPEED RANGE FOR SYNCHRONIZATION	Select the playback speed range when carrying out playback in variable mode from a remote control unit connected to the REMOTE (9P) connector. –1~+1: –1 to +1 times normal speed. [~1.5] : –1.5 to +1.5 times normal speed.
302	CAPSTAN RE-LOCKING DIRECTION	**In 525 mode** When the CAPSTAN in the sub LCD menu is set to 4FD, select whether the capstan servo should lock by accelerating or decelerating. [DECEL]: Lock by decelerating. ACCEL : Lock by accelerating.
		In 625 mode When the CAPSTAN in the sub LCD menu is set to 4FD or 8FD, select whether the capstan servo should lock by accelerating or decelerating. DECEL: Lock by decelerating. [ACCEL]: Lock by accelerating.
305	SYNC GRADE	When editing in phase-synchronized mode with item 004 set to ON, select the target phase synchronization accuracy. [ACCUR]: ± 0 frame accuracy. ROUGH: ± 1 frame accuracy.

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Menu items in the 300s, relating to editing operations (continued)

Item number	Item name	Settings
306	DMC INITIAL SPEED	In DMC editing, select the initial tape speed which is set automatically. MANUAL: the speed determined by rotation angle of the shuttle dial PLAY: normal playback speed STILL: still playback speed ±0.03 to ±1: the speed selected in this range (±0.03, ±0.1, ± 0.2, ±0.5, and ±1 times normal speed can be selected.)
307	AUTO-DELETION FOR INCONSISTENT DATA	Select what happens when an erroneous edit point is set. MANU: A warning is given by flashing the DELETE button on the control panel. The operator must manually delete the unnecessary edit point . NEG&E: When inconsistent edit points are set, such as when an OUT point is before an IN (or audio IN) point, or when too many edit points are specified, the previously set edit point is deleted. NEG: When inconsistent edit points are set, such as when an OUT point is before an IN (or audio IN) point, the previously set edit point is deleted. When too many edit points are specified, the DELETE button on the control panel flashes to give a warning. **Note** Pressing the button corresponding to an edit point to be deleted and the DELETE button simultaneously deletes the edit point. If an erroneous edit point is set (the DELETE button is flashing), editing is not executed.
308	SELECTION OF STD/ NON-STD FOR COMPOSITE VIDEO IN	Select the STD or NON-STD mode in accordance with a composite video input. AUTO: Detect automatically whether the input video luminance and chrominance signals are interleaved or not. If they are interleaved, select the STD mode. If they are not interleaved, select the NON-STD mode. STD: The STD mode is always used (forced STD mode). N-STD: Use this setting when color framing of the input video signal is unstable (forced NON-STD mode).

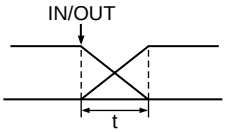
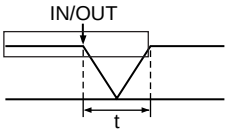
Menu items in the 300s, relating to editing operations (continued)

Item number	Item name	Settings
309	SERVO/AV REFERENCE SEL	Select the servo reference signal. AUTO1 : During recording, an analog composite or digital input video signal is used as the servo reference signal. During playback, the signal selected by the OUT REF in the sub LCD menu is used as the servo reference signal. If the signal selected by the OUT REF in the sub LCD menu is not connected, an internal reference signal is used. AUTO2: When the OUT REF is set to REF, and any of the ASSEMBLE, VIDEO, and AUDIO CH-1 to CH-4 indicators is lit, the reference signal for video/audio signal processing is locked to the input video signal. EXT: The servo reference signal is forced to be "EXT" (an external reference video input signal is used). *For details, see 2-4 "Setting Reference Video Signals".*
310	REC INHIBIT	Select the conditions under which recording is inhibited when the REC INHI switch on the control panel is set to ON. ALL: All tape recording is inhibited. CRASH: Crash recording is inhibited. Select this setting when you wish to carry out assemble editing. **Note** When the REC INHI switch is set to ON, the REC INHI indicator on the control panel lights. If an operation inhibited by this item is attempted, the REC INHI indicator flashes.

Items 311 to 314 (settings for digital audio editing): If you use an editor (BVE-600, etc) or a remote controller which cannot control digital audio edit preset, select how to activate edit preset of each digital audio channel on the unit using the analog audio edit preset function of the editor or remote controller.

Item number	Item name	Settings
311	ANALOG AUDIO EDIT PRESET REPLACE FOR CH 1	Select how to activate the CH-1 edit preset of the unit. NO DEFINITION : Not defined ANALOG CH 1: Use the edit preset for analog audio channel 1. ANALOG CH 2 : Use the edit preset for analog audio channel 2. ANALOG CH 1+CH 2: Use the edit preset for analog audio channel 1 or channel 2.
312	ANALOG AUDIO EDIT PRESET REPLACE FOR CH 2	Select how to activate the CH-2 edit preset of the unit. NO DEFINITION: Not defined ANALOG CH 1: Use the edit preset for analog audio channel 1. ANALOG CH 2: Use the edit preset for analog audio channel 2. ANALOG CH 1+CH 2: Use the edit preset for analog audio channel 1 or channel 2.
313	ANALOG AUDIO EDIT PRESET REPLACE FOR CH 3	Select how to activate the CH-3 edit preset of the unit. NO DEFINITION: Not defined ANALOG CH 1: Use the edit preset for analog audio channel 1. ANALOG CH 2 : Use the edit preset for analog audio channel 2. ANALOG CH 1+CH 2: Use the edit preset for analog audio channel 1 or channel 2.
314	ANALOG AUDIO EDIT PRESET REPLACE FOR CH 4	Select how to activate the CH-4 edit preset of the unit. NO DEFINITION: Not defined ANALOG CH 1: Use the edit preset for analog audio channel 1. ANALOG CH 2 : Use the edit preset for analog audio channel 2. ANALOG CH 1+CH 2: Use the edit preset for analog audio channel 1 or channel 2.

Menu items in the 300s, relating to editing operations (continued)

Item number	Item name	Settings
317	AUDIO EDIT MODE	Specifies the type of editing for digital audio signals. CUT EDIT: Cut editing (discontinuity in audio signal may result at the editing point, causing noise.) [CROSS FADE] : Cross-fade  FADE IN/OUT: Fade out and fade in  The “t” in the figures is the time set by item 803 “DIGITAL AUDIO FADE TIME”.
318	EDIT RETRY	For two-VTR editing, set when this unit is used as the recorder. Selects the operation if the recorder was not synchronized in time. OFF: Editing is not carried out, and the unit stops. [ON] : The editing is automatically retried (up to twice).
319	PREREAD SELECT	Select the signals used for preread editing. [A/V]: Both audio and video signals AUDIO: Audio signal only VIDEO: Video signal only.
320	DIGITAL AUDIO PB PROCESS ON EDIT POINT	Select the treatment of audio at edit points. CUT: Carry out a cut (possibly resulting in audio discontinuities at the edit point). [FADE] : Fade out and fade in.

Menu items in the 300s, relating to editing operations (continued)

Item number	Item name	Settings
326	AUTOMATIC IN ENTRY AFTER AUTO EDIT	Select whether or not to set the OUT point timecode for the IN point of the next auto-edit automatically when an auto-edit is completed. [OFF]: Do not set the IN point timecode automatically. R-IN: Set the recoder IN point timecode automatically. R-IN, P-IN: Set the recoder and player IN points timecode automatically. **Note** For audio split editing, only the video IN point is set automatically.

Menu items in the 400s, relating to preroll

Item number	Item name	Settings
401	FUNCTION MODE AFTER CUE-UP	Select the state that the unit goes into after a cuing-up operation. [STOP]: Stops (the “STOP mode”). STILL: Still playback (in search mode). **Note** When controlling this unit from an editor with the standard constants set, select “STOP”.
402	TIME REFERENCE FOR PREROLL	When prerolling a tape section at which timecode signals are discontinuous, select which to use, the timecode or CTL signals recorded preceding the section, for timecode advance and preroll. [CTL]: Using CTL signals TC: Using timecode signals
403	AUTOMATIC PREROLL REFERENCE ENTRY	Select whether or not the edit IN point is automatically set by pressing the PREROLL button when the IN point is not set before starting preroll. [DIS]: IN point is not set automatically. ENA: IN point is set automatically.

Menu items in the 500s, relating to tape protection

Item number	Item name	Settings
501	STILL TIMER	Select the time delay from the tape transport stopping (either the “STOP” mode” or the still playback mode in search mode) until the unit automatically switches to the tape protection mode, in order to protect the rotary heads and the tape. 0.5S... [8M] ...30M: Set the value in the range 0.5 seconds to 30 minutes.
502	TAPE PROTECTION MODE FROM SEARCH	Select the operation of the protection mode to protect the rotary heads and tape when in the still playback mode in search (jog/shuttle/variable) mode. [STEP]: Step forward at 1/30 normal speed every 2 seconds. STDBY: Switch to “Standby OFF mode” (the unit not on standby).

Menu items in the 600s, relating to the time code generator

Item number	Item name	Settings
601	VITC POSITION SEL-1 **Note** You can insert the VITC signal in two places. To insert it in two places, set both items 601 and 602.	**In 525 mode** Select a line to insert the VITC in. 12H... [16H] ...20H: Select any line from 12 to 20. **In 625 mode** Select a line to insert the VITC in. 9H... [19H] ...22H: Select any line from 9 to 22.
602	VITC POSITION SEL-2 **Note** You can insert the VITC signal in two places. To insert it in two places, set both items 601 and 602.	**In 525 mode** Select a line to insert the VITC in. 12H... [18H] ...20H: Select any line from 12 to 20. **In 625 mode** Select a line to insert the VITC in. 9H... [21H] ...22H: Select any line from 9 to 22.

Menu items in the 600s, relating to the time code generator (continued)

Item number	Item name	Settings
603	ID CODE PRESET	Select whether or not to set the ID code. OFF : Do not set the ID code. ON: Set the ID code. **To set the ID code:** ❶ Set this item to ON. The time data display area in the sub LCD flashes. ❷ Select jog mode and turn the jog dial to select the column, then hold down the search button while turning the jog dial to change the digit value. ❸ When the ID code setting is complete, press the SET button. This saves the ID code setting, and the setting of this item returns to “OFF”.
604	ID CODE SW	Select whether or not to record the ID code set using item 603 in the user bits. OFF : Record the normal data in the user bits. ON: Record the ID code in the user bits.
605	TCG REGEN MODE	Select the signal to be regenerated when the time code generator is in the regeneration mode (i.e., when the PRESET/REGEN switch in the timecode section is set to REGEN, or the unit is in automatic edit mode). TC&UB : Both the timecode and user bits are regenerated. TC: Only the timecode is regenerated. UB: Only the user bits ane regenerated.

Menu items in the 600s, relating to the time code generator (continued)

Item number	Item name	Settings
606	TC OUTPUT SIGNAL IN REGEN MODE	Select the signal output from the TIME CODE OUT connector during normal (×1) speed playback in the following two cases: • For tape playback when the INT/EXT switch in the timecode section is set to INT and the PRESET/REGEN switch is set to REGEN. • For preroll or postroll playback during automatic editing with the tape. [TAPE]: During tape playback, the playback timecode signal is output without regeneration (in this case the output video and the time code values output from the TC OUT connector do not agree). REGEN: The playback time code is output after regeneration.
607	U-BIT BINARY GROUP FLAG	Select the user bits to be used in the time code generated by the time code generator. [000]: Character set not specified. 001: 8-bit characters compliant with ISO 646 and ISO 2022. 010: Undefined. 011: Undefined. 100: Undefined. 101: SMPTE 262M page/line multiplex system. 110: Undefined. 111: Undefined.
608	PHASE CORRECTION	Select whether or not to carry out phase correction control on the LTC generated by the timecode generator. [OFF]: No control. ON: Carry out control.

Menu items in the 600s, relating to the time code generator (continued)

Item number	Item name	Settings
609	TCG CF FLAG	Select whether or not the color framing flag is set in the blank bit of the timecode. OFF: Color framing flag is not set. ON: Color framing flag is set. AUTO: Color framing flag is set or not depending upon the color framing phase relationship between the recorded video signal and the timecode. When AUTO is selected, color framing is controlled as follows according to the operating mode of the timecode generator. • In INT PRESET mode (the INT/EXT switch is set to INT, the PRESET/REGEN switch is set to PRESET, and in modes other than the automatic editing mode): the timecode is generated with color framing locked to the video signal, and the color framing flag is set. • In INT REGEN mode (the INT/EXT switch is set to INT, the PRESET/REGEN switch is set to REGEN, and in the automatic editing mode), and also in EXT mode (the INT/EXT switch is set to EXT): the timecode is generated with color framing locked to the video signal, and the color framing flag is not set.
610	REGEN CONTROL MODE	In editing performed using the control panel of this unit, select whether or not the timecode is automatically regenerated. AS&IN: In editing with this unit as the recorder, regardless of the setting of the INT/EXT and PRESET/REGEN switches, in assemble and insert editing , the timecode generator regenerates according to the timecode on the tape. ASSEM: In editing with this unit as the recorder, regardless of the setting of the INT/EXT and PRESET/REGEN switches, in assemble editing only, the timecode generator regenerates according to the timecode on the tape. MANU: Regardless of whether this unit is the recorder or player, the timecode generator operates in accordance with the setting of the INT/EXT and PRESET/REGEN switches. FULL: Regardless of whether local or remote, when any of the ASSEMBLE, VIDEO, AUDIO CH-1 to CH-4, and TC buttons is lit, the timecode generator regenerates according to the timecode played back from the tape.

Menu items in the 700s, relating to video control

Item number	Item name		Settings
701	SELECTION OF VIDEO/SYNC DELAY		An E-E video signal is output delayed with respect to the video input signal by the time for video circuit processing. With this item, select whether or not to delay the sync signal attached to the output video signal by an amount corresponding to the delay. SYNC: Delay the sync signal by the corresponding amount before attaching it. [VIDEO]: Attach a sync signal with the same timing as the input signal.
703	BLANK LINE SELECT		Switch blanking on or off for individual lines in the vertical blanking interval. The Y/C signal and odd/even fields are blanked simultaneously. **Note** For playback of an analog Betacam cassette (Betacam SP, etc.) regardless of the setting of this item, the chrominance signal is blanked up to line 15.
	Sub-Item		
	0	ALL LINE	[- - -]: Specify the blanking for each line separately. BLANK: Regardless of the setting of other sub-items, blank all lines which can be specified in this menu item. THROU: Regardless of the setting of other sub-items, switch off blanking for all lines which can be specified in this menu item.
In 525 mode	12...20	LINE 12... LINE 20	Specify blanking for lines 12 to 20. [BLANK]: Carry out blanking. THROU: Switch off blanking.
	21	LINE 21	Specify blanking for line 21. [BLANK]: Carry out blanking. HALF: Carry out half-blanking. THROU: Switch off blanking.
In 625 mode	9...22	LINE9... LINE 22	Specify blanking for lines 9 to 22. [BLANK]: Carry out blanking. THROU: Switch off blanking.
	23	LINE 23	Specify blanking for line 23. [BLANK]: Carry out blanking. HALF : Carry out half-blanking. THROU: Switch off blanking.

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Menu items in the 700s, relating to video control (continued)

Item number	Item name		Settings
704	DECODE Y/C SEP MODE Sub-item		Select the method of processing the input video signal in the vertical blanking interval, independently for each line.
In 525 mode	12...20	LINE12... LINE 20	Make the selection for lines 12 to 20. BPF: Carry out Y/C separation. B&W : Treat all as luminance signal.
	21...22	LINE 21... LINE 22	Make the selection for lines 21 and 22. BPF: Carry out Y/C separation. B&W: Treat all as luminance signal. COMB : Process with an appropriate Y/C separation.
In 625 mode	9...22	LINE 9... LINE 22	Make the selection for lines 9 to 22. BPF: Carry out Y/C separation. B&W : Treat all as luminance signal.
705	EDGE SUBCARRIER REDUCER MODE		During recording and playback of a composite signal, in the playback circuit the edge subcarrier reducer (ESR) is automatically switched on or off according to the VTR operation. When recording a “Non-Standard” signal, for example, if the color edge is not as good as with a proper signal, the ESR can be forced on. This item makes this selection. AUTO : ESR is switched on and off automatically. ON: ESR operation is forced on.
706	VERTICAL BLANKING V SHIFT		During noiseless variable playback, when the playback signal is an odd field and the reference signal is an even field, the playback signal is shifted by 1H (1 line) to suppress the vertical movement of the playback picture (“Y-add” function). This item selects whether or not to apply a 1H shift to the vertical blanking interval. ON : Carry out vertical blanking shift. OFF: Do not carry out vertical blanking shift. **Note** If the 1H shift is applied during the vertical blanking interval, the signal recorded in line 21 may intermittently appear at noiseless playback.

Menu items in the 700s, relating to video control (continued)

Item number	Item name	Settings
707	FORCED VERTICAL INTERPOLATION OFF	The “Y-add” function is normally switched on automatically during noiseless variable playback. This item selects whether or not to force the “Y-add” function off. [AUTO]: Automatically switches the “Y-add” function on. OFF: Force the “Y-add” function off.
710	INTERNAL VIDEO SIGNAL GENERATOR	Select the test signal to be output from the VTR’s internal test signal generator. When the SG in the sub LCD menu is set to VIDEO or BOTH (page 2-29)”, the internal test signal generator operates and outputs the selected test signal. This signal can also be recorded. [CB100] (625 mode) : 100% color bar signal [CB75] (525 mode) : 75% color bar signal CB75R: 75% color bar signal (reverse) BOW: Bowtie signal PLSBR: Pulse & bar signal MLTBS: Multi-burst signal HSWP: H sweep signal 5STEP: 5-step signal RAMP: Ramp signal SH: Shallow ramp signal RED: Red signal GRAY: 50% flat signal WHITE: 100% flat signal BB: Black burst signal SDI: SDI check field signal NTC7: NTC 7 test signal (selectable only in 525 mode) LN330: Line 330 test signal (selectable only in 625 mode)

Menu items in the 700s, relating to video control (continued)

Item number	Item name		Settings
712	VIDEO PROCESS ON CAP LOCK 2FIELD		When the CAPSTAN in the sub LCD menu or setup menu item 106 is set to 2FLD for 2-field playback, select whether or not to carry out a “picture shift”. [OFF]: No picture shift. ON: Carry out picture shift. **Note** To eliminate the adverse effect of the residual chrominance subcarrier component in the Y signal that is the result of the Y/C separation, this unit automatically applies a shift to the playback image in the H direction, so that even in 2-field playback a satisfactory image can be obtained.
713	VIDEO SETUP REFERENCE LEVEL (525 system)		Set the video setup amounts to be removed from a recording signal and Betacam playback signal, and to be added to a composite output signal. There are independent settings for a recording signal (referred to below as an input signal), a Betacam signal, and a composite output signal (referred to below as an output signal). **Notes** • Setup removal is carried out only with respect to a Batacam format CAV input signal (menu setting) and NTSC composite input signal. It is not carried out with respect to other input signals. • The setup amounts specified in this menu item have no connection with the SETUP/BLACK LEVEL knob on the front control panel.
	Sub-Item		
	0	MASTER LEVEL	When the input signal, Betacam playback signal, and output signal settings are “MSTER” (master), the setup amount specified for this sub-item is removed from the input signal and Betacam playback signal, and is added to the output signal. 0.0% ... [7.5%]...10.0%: Setting in this range, in 0.5% increments.
	1	INPUT LEVEL	[MSTER]: Set the input signal to the master setting. 0.0% ... 7.5% ...10.0%: Set the setup amount be removed from the input signal in this range, in 0.5% increments.

Menu items in the 700s, relating to video control (continued)

Item number	Item name		Settings
	2	INPUT VBLK CONT	REMOV: Remove the setup amount in the vertical blanking interval of the input signal. [THROU]: Do not remove the setup amount in the vertical blanking interval of the input signal.
	3	BETACAM PB LEVEL	[MSTER]: Set the Betacam playback signal to the master setting. 0.0%...7.5%...10.0%: Set the setup amount to be removed from the Betacam playback signal in this range, in 0.5% increments.
	4	OUTPUT LEVEL	[MSTER]: Set the output signal to the master setting. 0.0%...7.5%...10.0%: Set the setup amount to be added to the output signal in this range, in 0.5% increments.
714	VIDEO ADJUST RANGE		Select the variable range of the VIDEO and CHROMA knobs when the PROCESS CONTROL in the sub LCD menu is set to PANEL. [–3~+3]: –3 dB to +3 dB WIDE: – ∞ to +3 dB

Items 715 to 721: Settings for controlling the video processing system according to the menu settings.

Item number	Item name	Settings
715	VIDEO GAIN CONTROL	Adjust the video output level. Default value: 800H
716	CHROMA GAIN CONTROL	Adjust the chroma output level. Default value: 800H
717	CHROMA PHASE CONTROL	Adjust the chroma phase. Default value: 80H
718	SETUP LEVEL	Adjust the setup level (black level). Default value: 110H
719	SYSTEM PHASE SYNC	Adjust the system sync phase. Default value: 80H
720	SYSTEM PHASE SC	Adjust the system sub-carrier phase. Default value: 0H
721	Y/C DELAY	For playback from an analog Betacam cassette, adjust the Y/C delay. Default value: 800H

Note

When you make settings for items 715 to 721, set the PROCESS CONTROL in the sub LCD menu to SETUP. When set to SETUP, all controls on the front control panel and settings in the sub LCD menu are disabled.

Menu items in the 700s, relating to video control (continued)

Item number	Item name		Settings
723	INPUT VIDEO BLANK		Switch blanking on or off for individual lines in the vertical blanking interval of an input video signal. The Y/C signal and odd/even fields are blanked simultaneously. A signal with blanking carried out according to this setting is recorded.
	Sub-Item		
	0	ALL LINE	[- - -] : Specify the blanking for each line separately. BLANK: Regardless of the setting of other sub-items, blank all lines which can be specified in this menu item. THROU: Regardless of the setting of other sub-items, switch off blanking for all lines which can be specified in this menu item.
In 525 mode	12...20	LINE 12... LINE 20	Specify blanking for lines 12 to 20. [BLANK] : Carry out blanking. THROU: Switch off blanking.
In 625 mode	9	LINE 9	Specify blanking for line 9. BLANK: Carry out blanking. [THROU] : Switch off blanking.
	10...21	LINE 10... LINE 21	Specify blanking for lines 10 to 21. BLANK: Carry out blanking. [THROU] : Switch off blanking.
	22	LINE 22	Specify blanking for line 22. BLANK: Carry out blanking. [THROU] : Switch off blanking.

Menu items in the 700s, relating to video control (continued)

Item number	Item name	Settings
726	H BLANKING WIDTH	Select the horizontal blanking width of a video output signal. NARROW: Digital blanking (narrow) Selecting NARROW is recommended for longer H-period of video when editing is performed between digital devices. [WIDE]: Analog blanking (wide, complied with SMPTE 170A) Selecting WIDE is recommended for broadcast transmission or editing in which an analog device (i.e. BVW-series VTR) is used as recorder.
727	VIDEO EDIT PREVIEW SWITCHER	Set the output phase for the video playback signal when any of the ASSEMBLE, VIDEO, AUDIO CH-1 to CH-4, and TC indicators is lit. [INT]: The video playback signal output phase is the same as the output phase in the E-E mode. Use this setting when editing with a single VTR, or when previewing while watching the VTR output signal. EXT: The video playback signal output phase is the same as the phase of an input video signal or external reference signal. **Note** Whichever setting is used, the correct editing results will be obtained. When, however, you are using an external switcher to switch the video output signal from this unit for the purposes of preview, select EXT. This will prevent any image shifts at editing IN and OUT points.
728	OUTPUT SCH PHASE SETTINGS	Adjusts the SCH phase. Default value: [800H]
730	PICTURE SHIFT	Shifts the picture played back in Betacam SX mode. [OFF]: Do not shift. 1/4H: By 1/4 of the display area in the horizontal direction 3/4H: By 3/4 of the display area in the horizontal direction 1/4V: By 1/4 of the display area in the vertical direction 3/4V: By 3/4 of the display area in the vertical direction

Menu items in the 800s, relating to audio control

Item number	Item name	Settings
802	DIGITAL AUDIO MUTE IN SHUTTLE MODE	Set the digital audio muting conditions during shuttle playback. [OFF]: Not muted. CUEUP: Muted during cue-up or preroll operations. FULL: Muted in shuttle mode.
803	DIGITAL AUDIO FADE TIME	Specifies the time for cross-fade or fade in/out processing of digital audio signals. 5 ms, [10 ms], 15 ms, 20 ms, 25 ms [a], 50 ms [b], 85 ms, 115 ms [c] **Note** Cross-fade, fade in, or fade out processing is applied to the recordings after the IN or OUT point. Setting this item allows rewrite of the recordings after the OUT point. Even when the minimum value (5ms) is selected, one-field recordings are rewritten. To avoid rewrite, select CUT in menu item 317. However, the audio signals discontinue at edit points. (There is no effect on the recordings of the video signal.)
805	AUDIO MONITOR OUTPUT MIXING	Select the audio mixing method used for digital audio signals and Betacam playback analog audio signals supplied to the MONITOR OUTPUT connector. ADD: Simple addition. [RMS]: Root-mean-square. AVE: Simple average.
807	AUDIO OUTPUT PHASE	Select the output timing of a digital audio playback signal (SDI only). The reference position corresponds to a setting of 80H; when the setting is less than 80H, the output timing is advanced, and when it is higher than 80H, the output timing is delayed. (80H, 128 samples=approx. 2.7 ms, 1 sample=approx. 20 µs) 0...[80]...FF: Setting in this range

a) The cross-fade time is 24 ms.
b) The actual value is 49 ms.
c) The actual value is 114 ms.

Menu items in the 800s, relating to audio control (continued)

Item number	Item name	Settings
808	INTERNAL AUDIO SIGNAL GENERATOR	Select the operation of the internal audio test signal generator. SILNC: Silent signal. [1kHz] : At 1 kHz, –20 dB FS sine wave is supplied to all audio input channels. ID: Signal for recognizing each channel.
810	AUDIO EDIT PREVIEW SWITCHER	Set the output phase for the audio playback signal when any of the ASSEMBLE, VIDEO, AUDIO CH-1 to CH-4, and TC indicators is lit. [INT] : The audio playback signal output phase is the same as the output phase in the E-E mode. Use this setting when editing with a single VTR, or when previewing while watching the VTR output signal. EXT: The audio playback signal output phase is the same as the phase of an input video signal or external reference video signal. **Note** Whichever setting is used, the correct editing results will be obtained. When, however, you are using an external switcher to switch the audio output signal from this unit for the purposes of preview, selecting EXT will prevent any muting or discontinuities in the audio at editing IN and OUT points.

Menu items in the 900s, relating to digital processing

Item number	Item name	Settings
911	NO COMPRESSION LINE	Specify the “NO COMPRESSION” line (1 line in 1 field) for video input . OFF: No specification. 12H...21H (in 525 mode): Specify one of lines 12 to 21. 9H...22H (in 625 mode): Specify one of lines 9 to 22. **Notes** • The data in the specified line will be recorded and played back without video data rate compression. • Data values 0x00 and 0xFF will be converted to 0x01 and 0xFE for playback. • For the line specified in this item, it is not possible to carry out video adjustment, chroma adjustment, or other output adjustments. • When item 726 is set to WIDE, a number of words at the beginning and end of each line will be subject to horizontal blanking, and will not be played back. • For playback of a composite signal in jog or variable mode, according to the setting of item 705, the data will be subject to ESR (edge subcarrier reducer) processing.
912	SEQUENTIAL RECORD INPUT SIGNAL	Selects the signal input method for sequential recording on the recorder and player. PARALLEL: The video and audio signals you will record are input to the recorder and player separately. CASCADE: The video and audio signals you will record are input to the player, and input to the recorder as SDI output signals from the player.

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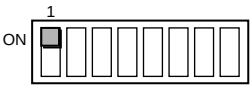
6-3-2 Extended Menu Operations

To access the extended menu, consult qualified Sony service personnel.

How to access the extended menu

Set switch 1 of the S201 on the internal SS-259 board to ON.



S201

In the extended menu, you can carry out the same operations as in the basic menu except setting of sub-items.

For details of basic menu operation, see section 6-2-2 "Basic Menu Operations".

To set sub-items

1 Confirm the JOG indicator lights. If not, set the unit to jog mode *(see page 3-3)*.

2 After selecting the menu item, holding down the STOP button, turn the jog dial to select the desired sub-item.

3 Holding down the search button, turn the jog dial to change the value for the selected sub-item.

Removing a Cassette When Tape Slack Occurs

If tape slack occurs in the unit, it is necessary to open the control panel manually and perform the procedure described in the Maintenance Manual (Part 1).

Consult a technician who has undergone service training when tape stack occurs.

Head Cleaning

To clean the rotary and stationary heads, always use the special-purpose Sony BCT-5CLN cleaning cassette. Follow the instructions with the cleaning cassette carefully, as inappropriate use of the cleaning cassette may damage the heads.

To carry out head cleaning, use the following procedure.

1 Insert the cleaning cassette.

2 Press the EJECT button while holding down PLAY button.

Head cleaning starts.

After a head cleaning operation which lasts for about 5 seconds, the cleaning cassette is automatically ejected.

Note

When carrying out head cleaning without using the automatic cleaning/ejecting function described above, be sure to eject the cleaning cassette immediately after the cleaning completes. If you leave the cassette in the unit, the heads will be worn down.

Moisture Condensation

When the unit is suddenly moved from a cold to a warm location, or used in a very humid place, moisture from the air can condense on the head-drum. This is called moisture condensation. If the tape is run in this state, it can adhere to the drum. To prevent such a condition from occurring, the unit is provided with a moisture detecting function.

If moisture condenses on the head-drum while the unit is in use, "ERROR-10" is displayed in the sub LCD.

If this happens, the drum and capstan motors stop. Then, the drum starts to rotate again to dry its surface. In this state, the unit is not operable. When the moisture has evaporated, the error message disappears and the WARNING indicator goes out.

If "ERROR-10" appears and the WARNING indicator lights immediately after powering the unit on

Leave the unit powered on and wait until the indicator goes out.
While the indicator is lit, you cannot insert a cassette.
When the indicator goes out and the error message disappears, you can use the unit.

If you move the unit from a cold to a warm location

Leave the unit powered off for about 10 minutes, in order to give the unit time to detect moisture condensation.

If you move the tape from a cold to a warm location

There may be moisture condensation on the tape. Wait until the tape warms.

Digital Hours Meter

The hours meter can display seven items of information, in corresponding display modes, about the operational history of the unit. Use it as a guide in scheduling periodic maintenance.

Display modes of the hours meter

H01: OPERATION mode
Displays the total number of hours the unit has been powered on in units of 1 hour.

H02: DRUM RUNNING mode
Displays the total number of hours the drum has run with tape threaded in units of 1 hour.

H03: TAPE RUNNING mode
Displays the total number of hours the unit has been in fast forward, rewind, playback, search, recording or editing (except for stop and still) mode in units of 1 hour.

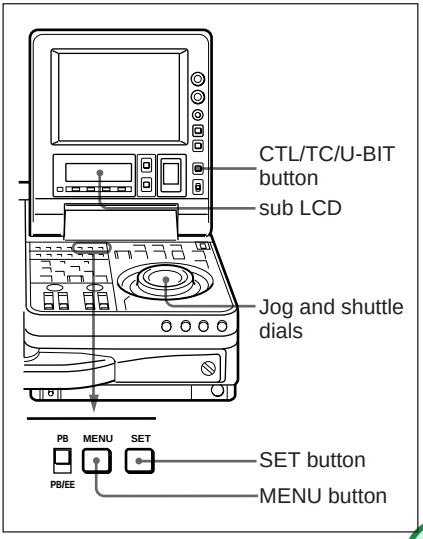
H04: THREADING mode
Display the total number of times tape has been threaded in the unit.

H12: DRUM RUNNING mode (resettable)
Same as H02 except that the count is resettable.
This can be used as a guide in determining when to replace the drum.

H13: TAPE RUNNING mode (resettable)
Same as H03 except that the count is resettable.
This can be used as a guide in determining when to replace such components as stationary heads and pinch roller.

H14: THREADING mode (resettable)
Same as H04 except that the count is resettable.
This can be used as a guide in determining when to replace, for example, the threading motor.

Displaying the hours meter



To display the hours meter

Press the MENU button, then turn the jog or shuttle dial to display the required item in the LCD monitor and sub LCD.

To access menu item H01 quickly

Press the MENU button, then the CTL/TC/U-BIT button.
Every time you press the CTL/TC/U-BIT button, menu item H01 or B01 is recalled alternately.

To exit from the hours meter

Press the MENU button or SET button.

Specifications

The specifications are common to both the recorder and player except otherwise mentioned.

General

Recording format
Betacam SX
Power requirements
12 V DC
Power consumption
120 W (60 W × 2)
Operating temperature
0°C to 40°C
(32°F to 104°F)
Storage temperature
–20°C to +60°C
(–4°F to 140°F)
Humidity 25 to 80%
Mass (total of recorder and player)
14 kg (30 lb 13 oz)
Dimensions (total of recorder and player)
422 × 149 × 443 mm
($5\ ^{7}/_{8} \times 16\ ^{5}/_{8} \times 17\ ^{1}/_{2}$ inches) (w/h/d, without projections)

Tape transport system

Tape speed
Betacam SX: 59.6 mm/s
Analog Betacam:
118.6 mm/s (525 system),
101.5 mm/s (625 system)
Digital record/playback time
60 minutes with BCT-60 SX
Analog Betacam playback time
30 minutes with BCT-30MA
Rewind time
Approx. 3 minutes with BCT-60SX
Search speed
Shuttle mode: Still to approx. ±24 times normal playback speed (Betacam SX), still to approx. ±10 times normal playback speed (Betacam/Betacam SP)
Jog mode: Still to ±1 times normal playback speed
Variable mode: Still to ±1 times normal playback speed
Servo lock time
0.5 seconds or less (from standby on, 2FD Lock)
Load/unload time
Approx. 6 seconds
Recommended cassettes
Betacam SX cassette (S): BCT-12SX/22SX/32SX/60SX
Betacam SP cassette (S): for both recording and playback
Betacam cassette (S): only for playback

Video system

Digital video signal system

Sampling frequency
Y: 13.5 MHz
R–Y/B–Y: 6.75 MHz
Quantization
8 bits/sample

Compression
MPEG2 4:2:2 Profile @ Main Level

Analog composite recording/playback

Bandwidth (Y)
0 to 4.5 MHz+0.5 dB/–3.0 dB (525 mode),
0 to 5.5 MHz +0.5 dB/–3.0dB (625 mode)
S/N 53 dB or more
Differential gain
2% or less
Differential phase
2° or less
Y/C delay 15 ns or less
K factor (2T pulse)
1.5% or less
Output SCH phase
Based upon RS-170A/ITU-R BT.624-3

Audio system

Digital audio signal system

Sampling frequency
48 kHz (synchronized with video)
Quantization
16 bits/sample
Wow and flutter
Below measurable level
Headroom
20 dB (or 18 dB, selectable)
Emphasis T1=50 µs, T2=15 µs (on/off selectable in recording mode)

Analog output

A/D, D/A quantization
16 bits/sample
Frequency response
20 Hz to 20 kHz +0.5 dB/–1.0 dB (0 dB at 1 kHz)
Dynamic range
88 dB or more (at 1 kHz, emphasis on, 30 kHz LPF ON)
Distortion
0.08% or less (at 1 kHz, emphasis on, reference level (+4 dBm), 30 kHz LPF ON)
Crosstalk –80 dB or less (at 1 kHz, between any two channels, 1 kHz BPF ON)

Others

Channel coding
S-I-NRZI PR-IV
Error correction
Reed-Solomon code
LCD monitor
Display method: Active matrix transmission
Size: 6.4 inches
Picture elements: 640 × 480 × 3 pixels
Luminance/brightness: Adjustable by knob

Analog Betacam playback (DNW-A220, player)

Video

		Metal tape	Oxide tape
Bandwidth	Y	30Hz to 4.5MHz +0.5 dB/–4.0dB	30Hz to 4.1MHz +0.5 dB/–6.0dB
	R–Y/B–Y	30Hz to 1.5MHz +0.5 dB/–3.0dB	30Hz to 1.5MHz +0.5 dB/–3.0dB
S/N	Y	51 dB or more	48 dB or more
	R–Y/B–Y	48 dB or more	45 dB or more
K factor (2T pulse)		2% or less	3% or less
LF non-linearity	Y	3% or less	
	R–Y/B–Y	4% or less	
Y/C delay		20 ns or less	

Audio (LNG)

	Metal tape	Oxide tape
Frequency response [a)]	50 Hz to 15 kHz +1.5 dB/–3.0dB	50 Hz to 15 kHz ±3.0dB
S/N [b)]	72 dB or more (Dolby NR on, weighted IEC-179A ave.)	50 dB or more (Dolby NR off, weighted DIN Audio rms)
Distortion [c)]	1.5% or less	2% or less

a) at 10 dB below reference level (+4 dBm)
b) at 3% distortion level
c) THD at 1kHz reference level (+4 dBm)

Analog Betacam playback (DNW-A220P, player)

Video

		Metal tape	Oxide tape
Bandwidth	Y	25 Hz to 5.5 MHz +0.5 dB/–4.0 dB	25 Hz to 4.0 MHz +0.5 dB/–6.0 dB
	R–Y/B–Y	25 Hz to 2.0MHz +0.5 dB/–3.0 dB	25 Hz to 1.5 MHz +0.5 dB/–3.0 dB
S/N	Y		46 dB or more
	R–Y/B–Y	48 dB or more	45 dB or more
K factor (2T pulse)		2% or less	3% or less
LF non-linearity	Y	3% or less	
	R–Y/B–Y	4% or less	
Y/C delay		20 ns or less	

Audio (LNG)

	Metal tape	Oxide tape
Frequency response [a)]	50 Hz to 15 kHz +1.5 dB/–3.0dB	50 Hz to 15 kHz ±3.0dB
S/N [b)]	62 dB or more	58 dB or more
Distortion [c)]	1.5% or less	2% or less

a) at 20 dB below peak level (3% dist. Level)
b) at 3% distortion level, CCIR 468-3 weighted, Dolby NR on
c) THD at 1kHz reference level (+4 dBm)

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Processor adjustment range

Video level
: ±3 dB/–∞ to +3 dB selectable

Chroma level
: ±3 dB/–∞ to +3 dB selectable

Setup level (525 mode)
: ±30 IRE

Black level (625 mode)
: ±210 mV

Y/C delay
: ±100 ns (in Betacam/Betacam SP playback)

Chroma phase
: ±30°

System phase
: Sync: ±15 µs (SC step)
: SC: ±200 ns

Input connectors

SDI IN
: BNC (1)
: Serial digital (270 Mbits/s)
: SMPTE 259M/ITU-R BT.656-3

REF. VIDEO IN
: BNC (2 in loop through connection with 75 Ω termination)
: Black burst
: 40 IREp-p (525 system) or 0.3 Vp-p (625 system), 75 Ω, sync negative

VIDEO INPUT
: BNC (2 in loop through connection with 75 Ω termination)
: 1.0 Vp-p, 75 Ω, sync negative

AUDIO INPUT CH-1/2
: XLR 3-pin, female (2)
: –60/0/+4 dBu, high impedance, balanced

TC IN
: BNC (1)
: 0.5 to 18 Vp-p, 10 kΩ

DC IN
: XLR 4-pin

Output connectors

SDI OUT 1/2
: BNC (2)
: Serial digital (270 Mbits/s)
: SMPTE 259M/ITU-R BT.656-3

VIDEO OUTPUT 1/2(SUPER)
: BNC (2) (Character superimpose is possible on the 2 (SUPER) output.)
: 1.0 Vp-p, 75 Ω, sync negative

AUDIO OUTPUT CH-1/3, CH-2/4
: XLR 3-pin, male (2)
: +4 dBm at 600 Ω load, low impedance, balanced

MONITOR OUTPUT L/R
: XLR 3-pin, male (2)
: +4 dBm at 600 Ω load, low impedance, balanced

TC OUT
: BNC (1)
: 1.0 Vp-p, 75 Ω

HEADPHONES
: JM-60 stereo phone jack
: –∞ to –20 dBu at 8 Ω load, unbalanced

Remote connectors

REMOTE
D-sub 9-pin, female
AUX

Accessories supplied

75Ω coaxial cable with BNC plugs (1, for SDI connection)
9-pin remote control cable (1)
Shoulder belt (1)
Operation Manual (1)
Coin screws (12)
Maintenance Manual Part 1 (1)

Optional accessories

AC-DN2(A) AC Adaptor
AC-550/550CE AC Adaptor
BP-L60(A)/L90(A) Battery Pack
BP-90(A) Battery Pack
BC-L100/L100CE/L50 Battery Charger (for BP-L60(A)/L90(A))
BC-210/210CE Battery Charger (for BP-90(A))
BC-410/410CE Battery Charger (for BP-90(A))
DC-L90 Battery Adaptor (for BP-90(A))
BVR-3 Remote Control Unit (limited function)
BCT-5CLN Cleaning Cassette Tape
LC-DN220 Carrying Case (hard case)
LC-DN220SFT Carrying Case (soft case)

Design and specifications are subject to change without notice.

Note on liquid crystal display panel

The liquid crystal display fitted to this unit is manufactured with high precision technology, giving a functioning pixel ratio of at least 99.99%. Thus a very small proportion of pixels (at most 0.01%) may be “stuck”, constantly on or constantly off. In addition, over a long period of use, because of the physical characteristics of the liquid crystal display, such “stuck” pixels may appear spontaneously.

These problems have been kept to the absolute minimum, but are an unavoidable characteristic of liquid crystal technology.

Information Displayed on the LCD Monitor

The LCD monitor displays setup menus, error messages, time data, and information about the unit's operating status.

For more information about the setup menus, see chapter 6 "Setup Menu".

To adjust the screen

Use the BRIGHT and CONTRAST knobs to adjust the brightness and contrast of the screen.
To make the back light brighter, set the BACKLGT in the sub LCD menu to HIGH *(see page 2-32)*.

To display superimposed text information

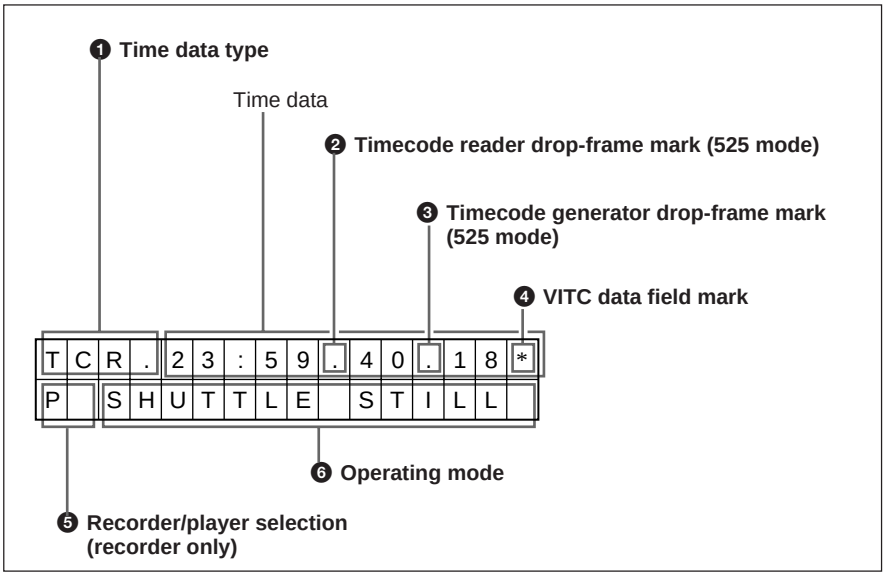
To display superimposed time data and text information about the operating status of the unit, set the SUPER in the sub LCD menu to ALL *(see page 2-31)*.
When SUPER is set to ALL or CPSTALL, the text information is also superimposed on the output of VIDEO OUTPUT connector 2 (SUPER).

To adjust the displayed text

You can adjust the position, size, and type of superimposed information using setup menu items 002, 003, 009, and 011.

For details, see pages 6-2 and 6-4.

The figure on next page shows the time data and operation status that can be superimposed.



Note

The example above shows the factory default configuration.
You can use setup menu item 005 to display a different type of time data in the second line as well.

For details, see page 6-3.

❶ Time data type

Display	Meaning
CTL	CTL counter data
TCR	LTC reader timecode data
UBR	LTC reader user bits data
TCR.	VITC reader timecode data
UBR.	VITC reader user bits data
TCG	Timecode generator timecode data
UBG	Timecode generator user bits data
IN	IN point time data
OUT	OUT point time data
AI	AUDIO IN point time data
DUR	The duration between any two of the three edit points (IN, OUT, AUDIO IN)

Note

Asterisks are displayed in this block when timecode or user bits could not be read correctly, for example as T∗R, U∗R.

❷ Timecode reader drop-frame mark (525 mode)

[.] (period): Indicates drop-frame mode.

[:] (colon): Indicates non-drop frame mode.

❸ Timecode generator drop-frame mark (525 mode)

[.] (period): Indicates drop-frame mode (factory default).

[:] (colon): Indicates non-drop frame mode.

❹ VITC data field mark

[ ] (blank): Display of fields 1 and 3

[∗] (asterisk): Display of fields 2 and 4

❺ Recorder/player selection (recorder only)

The indication changes depending on the status of the RECORDER/PLAYER indicators.

No display: When the RECORDER and PLAYER indicators are both not lit.

P: The PLAYER indicator is lit.

R: The RECORDER indicator is lit.

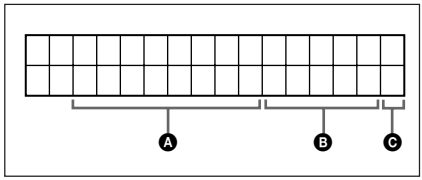
❻ Operating mode

The display is divided into blocks A, B, and C, shown in the figure below.

Block A: Operating mode

Block B: Servo lock status or tape speed

Block C: The ■ mark, indicating an auto editing segment



The contents displayed in each block are listed on next page.

Display		Operating Mode
Block A	**Block B**	
TAPE UNTHREAD		No cassette loaded
STANDBY OFF		Standby off mode
T. RELEASE		Tension release mode
STOP		Stop mode
F. FWD		Fast forward mode
REW		Rewind mode
PREROLL		Preroll mode
PLAY		Playback mode (servo unlock)
PLAY	LOCK	Playback mode (servo lock)
PLAY	% difference with respect to normal speed	Capstan override mode
REC		Recording mode (servo unlock)
REC	LOCK	Recording mode (servo lock)
SEQ REC		Sequential recording mode (servo unlock)
SEQ REC	LOCK	Sequential recording mode (servo lock)
EDIT		Editing mode (servo unlock)
EDIT	LOCK	Editing mode (servo lock)
JOG	STILL	Jog mode still picture
JOG	FWD	Forward jog
JOG	REV	Reverse jog
SHUTTLE	(speed)	Shuttle mode
VAR	(speed)	Variable mode
PREVIEW		Preview mode
AUTO EDIT		Auto edit mode
REVIEW		Review mode
D-PREV	(speed) a)	DMC edit preview mode
D-EDIT	(speed) a)	DMC edit mode
DMC-SPD	(speed)	DMC initial speed setting

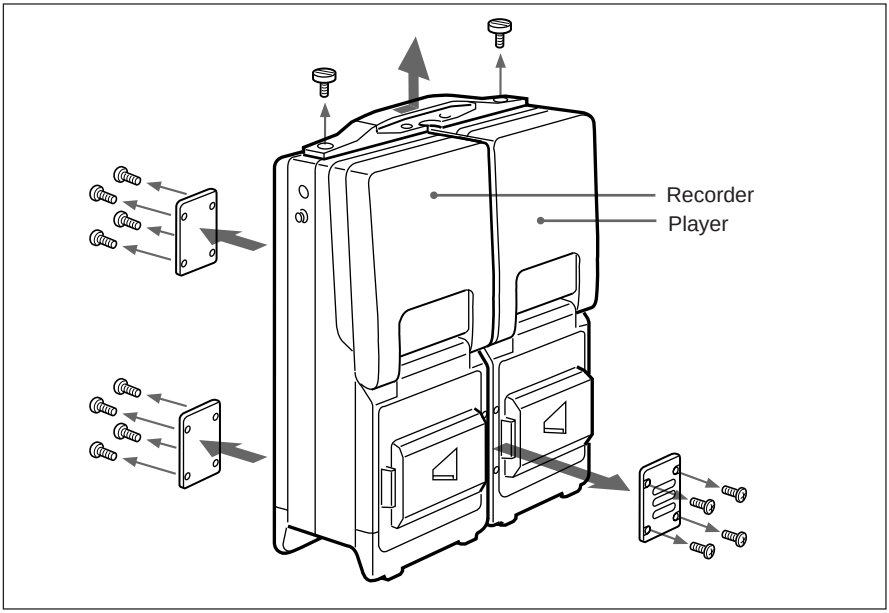
a)Initial speed or speed stored in memory

Separating into Two VTRs

The following figure shows how to separate the unit into two VTRs.

Note

If you separate the unit or combine the recorder and player incorrectly, the recorder or player may fall down and cause body injury. Follow the procedures described below for separation or combination.



Attaching the fixing plates

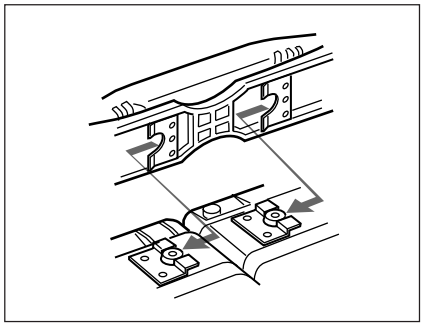
If you want to be able to separate and combine the VTRs without using tools such as screwdrivers, replace the screws (M3) that hold the fixing plate in place with the supplied coin screws.

Note

The coin screws for fixing the handle have washers. When you remove the handle, keep the screws and washers by fastening them to the handle.

To combine the recorder and player

Reverse the steps for separation in a horizontal position.
The figure shows how to fit the handle.

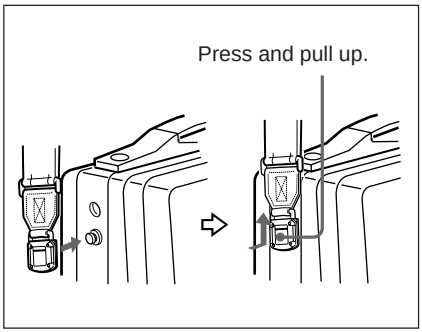


Using the Shoulder Belt

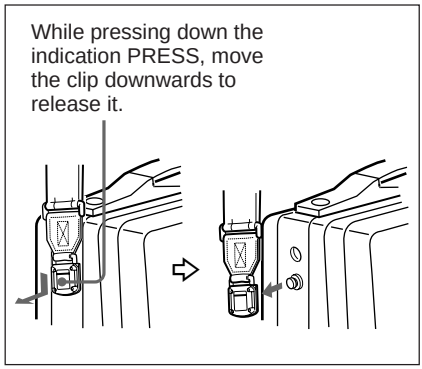
The following figures show how to fit the supplied shoulder belt.

Note

If you fit the shoulder belt incorrectly, the unit may fall down and cause body injury. Follow the procedures described below to fit or remove the shoulder belt.



To remove the shoulder belt



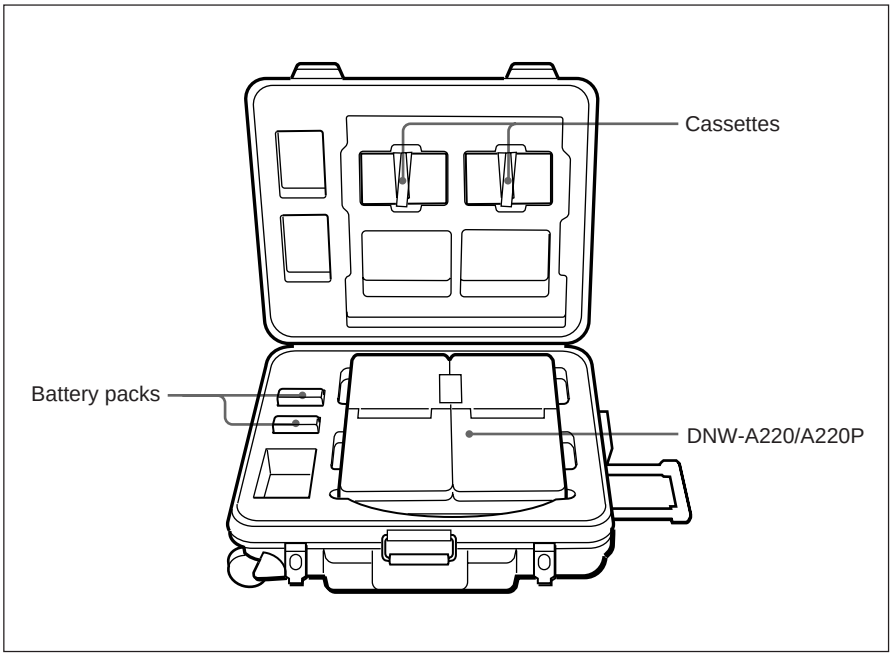
Using the Carrying Case

The following figure shows how to pack the LC-DN220 Carrying Case (not supplied).

Follow the procedures described below to pack the carrying case.

Note

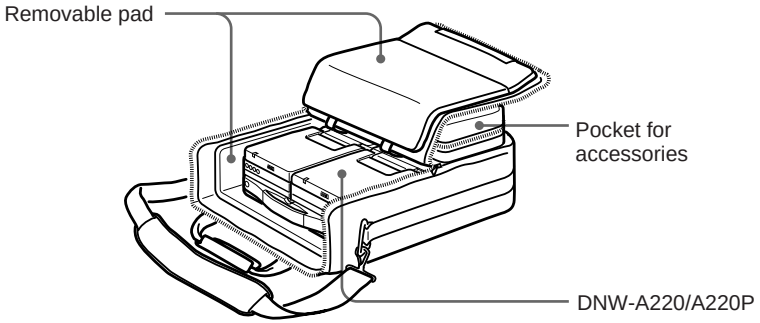
If you pack the carrying case incorrectly, the unit or accessories may fall down and cause body injury.



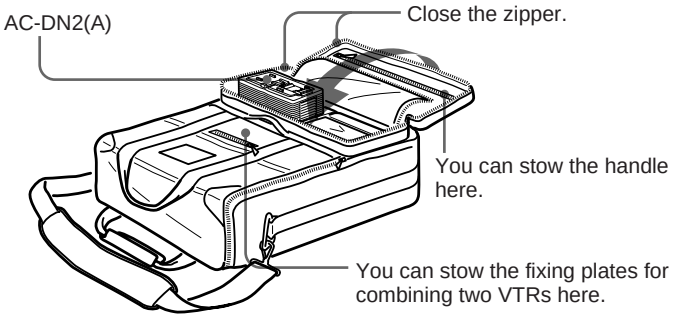
Using the Soft Carrying Case

LC-DN220SFT Carrying Case (soft case) is designed for one DNW-A220/A220P unit or two DNW-A25/A25P units.

Packing the case



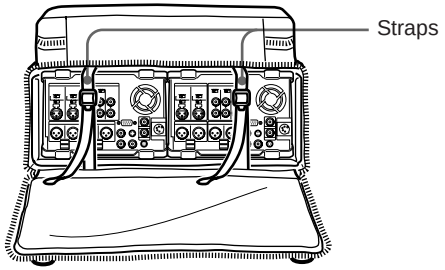
When the AC-DN2(A) is attached



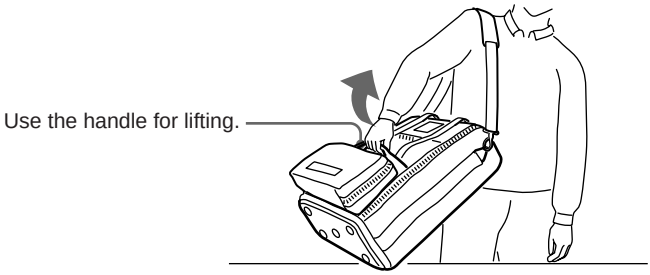
http://getMANUAL.com

Note

Always keep the straps fastened to prevent the units from falling out.



Placing the case on a flat surface



Glossary

Assemble editing
Editing in which new video/audio is added in sequence to the end of existing recorded video/audio.

Bridge connection
A connection which allows a signal input to an input terminal to pass through the unit and exit from an output terminal as input to external equipment.

B-Y signal
One of the color difference signals, the B (blue) signal minus Y (luminance) signal.

Capstan
A drive mechanism that moves the tape at a specified speed. Its rotation is normally synchronized with a reference sync signal.

Chrominance signal
A signal which carries information about hue and saturation. Also called "C signal".

Condensation
Moisture which condensed on tape transport mechanisms. If there is condensation on the head drum, tape sticks to drum and the VTR may malfunction.

CONFI playback
This refers to playback of the audio and video signals immediately after recording, using the confidence heads, the signal being output to all intents and purposes simultaneously with recording. This is used to check recording.

Component video signal
A signal that consists of a luminance signal (Y) and two chrominance signals (Y–R, Y–B).

Composite video signal
A signal that consists of video, sync and color burst signals.

CTL
Control signal in the form of regular pulses recorded along a longitudinal track on the videotape. By counting these pulses, it is possible to determine the number of frames, and hence the tape's running time. Used mainly to adjust the tracking position of video heads, and to achieve timecode continuity in continuous recording.

Digital VTR
On a digital VTR, video and audio signals are recorded on magnetic tape and, unlike on an analog VTR, can be played back without any quality deterioration.

Drop frame mode
Time code runs at 30 frames/sec. The NTSC system, however, runs at about 29.97 frame /sec. Drop frame mode adjusts this difference. The timecode and video are synchronized by dropping the first two frames of the timecode every minute, except at the ten-minute marks.

Drum
See "Head drum".

E-E mode
Abbreviation of "Electric to Electric" mode. In this mode, video and audio signals input to the VTR are output after passing through internal electric circuits, but not through magnetic conversion circuits such as heads and tapes. This can be used to check input signals and for adjusting input signal levels.

Emphasis
The signal is emphasized at high frequencies. During playback, it is de-emphasized. This suppresses noise without affecting the original signal.

External lock
Synchronizing one equipment (slave unit) to another (master unit). The signal and tape run of the VTRs used for editing, player and recorder, are usually synchronized.

Head drum
A metal cylinder to which a video head is attached. This drum is rotated at high speeds in synchronization with the sync signal during recording and playback.

Insert editing
Editing in which new video/audio is added into the middle of existing recorded video/audio.

IRE
A unit for representing a video level laid down by the IRE (Institute of Radio Engineers). The IRE is now the IEEE (Institute of Electric and Electronic Engineers).

Non-drop frame mode
The number of frames of the timecode and video run is not adjusted. When you use the timecode in non-drop frame mode, the real playback time will be about 86 seconds shorter per day than the timecode. If you edit frame by frame or if you determine the length of a shot by counting the timecode, use drop frame mode.

Loading
Also called “threading”. To pull the tape out of the cassette case, thread it along the specified tape path, and wrap it on the drum in order to prepare it for recording or playback. The VTR automatically loads the cassette tape when you insert the cassette into the cassette compartment. There are two loading modes: standby-on mode and standby-off mode.

LTC
Abbreviation of “Longitudinal Time Code”. This timecode is recorded on a longitudinal track on the tape. Reading is unreliable at low speeds, and not possible at all during still playback. *See also “VITC”.*

Luminance signal
A signal that determined the brightness of the picture. Also called “Y signal”.

Preroll
Running of a video tape to a prior to an edit-start point to enable the tape to reach a steady speed and to be synchronized with other video tapes.

Quantization
The level resolution when an analog signal is sampled before converted into a digital signal. 8-bit quantizing has 256 levels and 10-bit quantizing has 1024 levels. Generally, 8-bit quantizing is used for video signals and 16-bit quantizing is used for audio signals. The fewer the quantizing steps, the more distortion is in the analog signal when the digital signal is reconverted into analog signal.

Reference video signal
A video signal which contains a sync signal or sync and burst signals, used as a reference for synchronization of video equipment.

R-Y signal
One of the color difference signals, the R (red) signal minus Y (luminance) signal.

Sampling frequency
The unit of time used when converting an analog signal with a continuously varying level to digital form by sampling the level at a fixed interval. In general, a higher sampling frequency makes it possible to digitize analog signals of a higher frequency.

SCH
Abbreviation of Sub Carrier to Horizontal. The phase of the subcarrier with respect to the phase of the horizontal synchronization signal. In editing of monochrome video, phase continuity is maintained by editing in units of frames (two fields), so that the continuity of the horizontal synchronization signal phase is maintained. Editing of color video must be done in units of two frames (four fields) to maintain subcarrier continuity. The SCH of a field can be checked to find out which of the four fields it represents. This allows edited video signals to be joined while maintaining subcarrier continuity.

Search
Viewing the picture or timecode by running the tape in fast forward or rewind mode, in order to search for a particular scene.

Servo
A mechanism that controls the number and phase of rotations of the head drum or capstan. Servo mechanism allows playback of the video signal without guard band noise. The reference signal of the servo control is normally a vertical sync signal.

Servo lock
This refers to the synchronization of the phase of the drum rotation and the reference signal for the tape transport position, so that the video heads can trace the same pattern on the tape for playback and recording.

SMPTE
Abbreviation of Society of Motion Picture and Television Engineers, a professional association established in the USA.

S/N
Signal-to-Noise ratio. The relation of the strength of the desired signal to the accompanying electronic interference, the noise. If S/N is high, sounds are reproduced with less noise and pictures are reproduced clearly without snow.

Standby-off mode
One of the stop modes. In this mode, head drum rotation is stopped and the tape tension is slackened. It is not possible to switch instantaneously from this mode to recording or playback mode. This mode is not harmful to the tape or heads.

Standby-on mode
One of the stop modes. In this mode, the head drum continues rotating and the tape remains wound onto the drum. This mode enables instantaneous switching to recording or playback mode. To prevent damage to the tape or heads, the device automatically switches from standby-on mode to standby-off mode after a certain period of time.

Subcarrier
Color information contained in a composite video signal. Its amplitude is for color saturation and its phase to color burst is for hue.

Superimpose
To put one picture (or characters) onto another so that both can be seen at the same time.

Sync
A reference signal consisting of vertical and horizontal sync signals used for synchronizing the scanning patterns of the video camera and the monitor.

Tape tension
The tension applied to a tape. For the tape to run properly while being wound on the drum, it must be pulled lightly in the opposite direction to the direction of transport. Improper adjustment of tape tension can cause deviations along the temporal signal axis. In analog VTRs, these deviations are evident as skew and distortion in the upper part of the screen.

Time code
The timecode is a tape position information signal that includes time and frame data that are recorded onto the tape so as to facilitate searching of editing points and recorded scenes when viewing or editing. SMPTE timecode is applied to NTSC system, and EBU timecode is applied to PAL/SECAM systems. There are two kinds of signal recorded on tape. One is longitudinal timecode (LTC) recorded along the tape (the same way as audio and CTL signals). The other is vertical interval timecode (VITC). This code is inserted in the vertical blanking period and its recorded on the tape with video signals.

Time data
This refers either to time data that is generated by a timecode generator or time data that is played back from a tape and read by a timecode reader.

Unloading
When the EJECT button is pressed, the VTR automatically winds the tape back into the cassette case. Also called “Unthreading”.

User bits
These are also referred to as “users’ bits”. The user bits are a 32-bit segment of the timecode recording area. The user can select what to record in this segment and how to use the recorded data. For example, it can be used to record data information in addition to the timecode data or ID numbers for tape reels or programs. LTC user bits are used to record good shot marks.

V (vertical)-blanking
The portion of the video signal that occurs between the end of one field and the beginning of the next. During this time, the electron beams in monitors are turned off so that they can return from the bottom of the screen to the top without showing tracks of movement on the screen. When the position of v-blanking is not adjusted correctly, a horizontal black bar appears on the screen.

Video gain
Amount of amplification for video signals, expressed in decibels (dB).

VITC
Abbreviation of “Vertical Interval Time Code”. This timecode is inserted in the vertical blanking interval and recorded on the video tracks. It can be read at low speeds and during still playback, but not during high-speed playback.
See also “LTC”.

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DNW-A220/A220P
(SY)
3-861-441-**05**(1)

Sony Corporation
Broadcasting & Professional Systems Company

Printed in Japan
1999.05.13
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